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ANNUAL REPORT

OF THE

WISCONSIN GEOLOGICAL SURVEY

FOR THE YEAR 1879.

By T. C. CHAMBERLIN,
Chief Geologist.

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To His Excellency, WM. E. SMITH,
Governor of Wisconsin:

SIR:—I have the honor to present, herewith, a brief report of the progress of the Wisconsin Geological Survey, for the year 1879.

Very respectfully, your obedient servant,

T. C. CHAMBERLIN,
Chief Geologist.

BELOIT, *December* 31, 1879.

ANNUAL REPORT, 1879.

My last annual report brought the history of the survey up to the close of 1878. The organic law of the survey designated the 31st of March, 1879, as the date on which the survey was to be completed; so that but three months of the time allotted for its prosecution fell within the present year. These, from the nature of the season, as well as the condition of the work, were mainly devoted to laboratory investigations, the preparation of manuscript maps and illustrations for the final report, the labelling and distribution of specimens, and the miscellaneous work that necessarily attends the closing of a survey and the publication of its results. Some supplementary field work has been done, but the amount has not been large, and has consisted mainly of revisits to districts previously examined, for the purpose of securing additional data. There is, therefore, less than usual of public interest that falls appropriately within the province of an annual report, whose main purpose is to present the administrative history of the work. The final studies upon the accumulated data have developed many interesting and valuable results, but these will soon find a better presentation in the more elaborate final report. The progress that has been made in the preparation and publication of that report claims a few words.

PUBLICATION.

The plan of publication has been stated in previous annual reports. To save inquiries, I beg leave, however, to reiterate, what has been repeatedly published before, that Volume I, owing to the requirements of the law of publication, will appear last. It is in part prepared, but its completion must await the finishing of

Publication.

all the detailed studies involved in the preparation of the other volumes. Volume II was issued in the fall of 1877. This volume related mainly to the Paleozoic series of the eastern, central and southwestern portions of the state. It was originally planned that the third volume should treat of the remainder of the Paleozoic territory, which mainly lies adjacent to the upper Mississippi, and of the fossils of the state, thus completing, essentially, the discussion of the fossiliferous formations—the space that might remain in the volume to be filled with the report on the extreme northwestern portion of the state. In pursuance of this plan, about half of the volume was composed and stereotyped, when it was found that more time than had been anticipated would be required for the satisfactory execution of some portions of the lithographic work. To prevent corresponding delay in the appearance of the series of volumes, taken as a whole, a modification of the plan of publication was adopted.

The manuscript report on the iron- and copper-bearing formations of the northwestern portion of the state, that was intended to form a part of the volume above outlined, was joined with the reports on the Menominee iron region, to constitute a volume, leaving the one then half stereotyped to be completed with other matter. This change brings the main discussions of the two great metalliferous formations together in one volume, an advantage which perhaps compensates for the lack of the geographical consecutiveness which the original plan proposed.

Manuscript for this volume, which it was now thought best to designate number three, was placed in the printer's hands the first of May, and the volume is now (January 1st) in the binder's hands, and will probably be placed before the public as soon as this sketch. The half-completed volume, laid temporarily aside, will next be completed, to be followed by Volume I, which will, among other things, treat compendiously of the general geology of the state.

DISTRIBUTION OF SPECIMENS.

Section 3 of the organic law of the survey, provides that

"It shall be the duty of said geological corps, in the progress of the examinations hereby directed, to collect such specimens of rocks, ores, fossils, minerals, etc., as may be necessary to exemplify the geology of the state. Sets of these specimens shall be deposited with the Wisconsin Academy of Sciences, Arts and Letters, and the State University, and with each one of the incorporated colleges of the state, and with each of the normal schools; *provided*, application be made to the chief geologist before the commencement of field work."

In pursuance of this requirement, large collections have been made during the progress of the survey. Of these, about 20,000 specimens have been distributed during the year. By far the greater portion of these were fossils. The most of the ores and the lithological specimens have been retained for studies not yet completed. A part of these are now being prepared for distribution, but some must yet be retained.

The interests of science demand that those specimens which have been made the types of special descriptions, should be kept together where they may be accessible to investigators. The law, as will be seen, makes no specific discrimination among the institutions entitled to receive specimens, but may be thought to imply that precedence should be given to the Wisconsin Academy of Sciences, Arts and Letters, and the State University. Using the discretion which the constituted legal counsel of the state advises me lies within the prerogatives of my office, it has seemed to me best to place the collection of type fossils with the Academy of Sciences, Arts and Letters, and the collection of type lithological specimens with the State University, as they will thus presumptively be most available to the majority of scientists who may desire to examine them, since the description of new fossil species, within the state, will doubtless mainly be made through the medium of the Academy, while the study of lithological specimens requires chemical and microscopical appliances, best found

Distribution of Specimens.

at the University. The remaining specimens that were distributed were carefully arranged in sets as nearly equal as practicable, and assigned by lot to the twelve institutions entitled to receive them. The portion of the collection so allotted numbered about 1,700 specimens for each institution. The entire number of species of fossils represented is about 800.

In preparing the specimens for distribution, two very small tickets, in green and red colors, were glued to each specimen. On the green tickets were placed numbers corresponding to those of the following list of names of fossil species (Catalogue A), and on the red tickets numbers corresponding to those of the following list of localities whence the specimens were obtained (Catalogue B). As these lists are equally applicable to all the collections, it is scarcely possible that names and localities can be lost beyond recovery, except through the destruction of the small tickets attached to the specimens, the danger of which is not great, and may be reduced to a minimum by a little care on the part of the institutions with which the specimens are placed. In the case of some of the lithological specimens yet to be distributed, numbers have been painted directly on the specimens — a still safer method, but one not entirely practicable with the collection of fossils. The printing of the catalogues here will secure them against liability to entire destruction, and will also facilitate the loan of specimens for any future investigation, in which it may be desirable to bring together all the specimens of the species.

Catalogue A.

CATALOGUE A.

LIST OF THE NAMES AND SPECIMEN-NUMBERS OF FOSSILS DISTRIBUTED DURING THE PRESENT YEAR.

The numbers given in this catalogue correspond to those found on the *green* tickets attached to the specimens. The species marked with an asterisk are those that are originally described in the reports of this survey.

ABBREVIATIONS OF THE NAMES OF AUTHORS OF ORIGINAL DESCRIPTIONS OF SPECIES.

Bar., Barrande.
Dal., Dalman.
D'Orb., D'Orbigny.
E. & H., Edwards and Haime.
Eich., Eichwald.
Goldf., Goldfuss.
Gr., Green.
Guett., Guettard.
H., Hall.
H. & W., Hall & Whitfield.
Linn., Linnæus.
M., Meek.
McC., McChesney.
M.-E., Milne-Edwards.
Murch., Murchison.
N., Nicholson.
N. & H., Nicholson & Hinde.
Newb., Newberry.
O., Owen.
Rœ., Rœmer
Rom., Rominger.
Saff., Safford.
Salt., Salter.
Shum., Shumard.
S'by., Sowerby.
Wahl., Wahlenberg.
Whitf., Whitfield.
Winch., Winchell.
W. & M., Winchell & Marcy.

LIST OF SPECIES.

1. Palæophycus duplex. H. ??
1-*a*. P. simplex. H.
2. P. sp. undet.
3. Palæochorda, sp. undet.
4. Cruziana sp. undet.
5. Scolithus = ? annelid tubes
* 5-*a*. S. Woodi. Whitf.
6. Dendrograptus Hallianus. Prout.
7. Columns of Crinoids and impressions of Plates and Disks.
8. Lingula ampla. O.
9. L. Mosia. H.
10. L. Winona. H.
11. Lingulepis pinnaformis. O.

Catalogue A.

12. Lingulella aurora. H. .
13. L. aurora var. = Lingula aurora. H.
14. Discina? inutilis. H.
15. Obolella polita. H.
16. Obolella (= one in King's Report). H. & W.
17. Leptæna Barabuensis. Winch.
18. Orthis Pepina. H.
*19. Triplesia primordialis. Whitf.
*20. Palæacmæa Irvingi. Whitf.
21. Platyceras primordialis. H.
22. Ophileta (Raphistoma) primordialis = Straparollus (Ophileta) primordialis. Winch.
23. Euomphalus? vaticinus. H.
24. Pleurotomaria? advena. Winch.
25. Serpulites? Murchisonia. H. (We are inclined to consider this species rather as related to the genus Dentalium than as the tube of an annelid. R. P. W)
26. Bellerophon antiquatus. Whitf.
27. Hyolithes primordialis = Theca primordialis. H.
28. Agnostus disparalis. H.
29. A. Josepha. H.
30. A. paralis.
31. Aglaspis Barrandi. H.
*31-*a*. A. Eatoni. Whitf.
*32. Amphion? new sp.
33. A. ? matutina. H.
34. Arionellus bipunctatus. Shum.
*35. A. (Agraulos) convexus. Whitf.
36. A. sp. new.
*37. A. (Bathyurus) Woosteri. Whitf.
38. Bathyurus, new species.
39. Chariocephalus Whitfieldi. H.
40. Conocephalites anatinus. H.
41. C. binodosus. H.
*42. C. calymenoides. Whitf.
43. C. diadematus. H.
44. C. (Arionellus) dorsalis. H.
45. C. eos. H.
46. C. Eryon. H.
47. C. Hamulus. O.
48. C. Iowensis. O.
49. C. minor. Shum.
50. C. nasutus. H.
51. C. optatus. H.
52. C. Oweni. H.
53. C. Patersoni. H.
54. C. Perseus. H.
55. C. Shumardi. H.
56. C. Winona. H.
57. C. Wisconsensis. O.
*58. C. explanatus. Whitf.
*58-*a*. C. quadratus. Whitf.
59. Crepicephalus Wisconsensis = Conocephalites Wisconsensis of list.
60. Dicellocephalus Minnesotensis. O.
61. D. Minnesotensis, var. limbatus. H.
62. D. Miniscaensis. O.
63. D. Miniscaensis, var. H.
64. D. Misa. H.

Catalogue A.

65. Discellocephalus, Osceola. H.
66. D. Pepinensis. O.
67. D. Spininger. H.
*67–*a*. D. Lodensis. Whitf.
68. Illænurus quadratus. H.
68–*a* Lonchocephalus Chippewaensis. O.
69. Menocephalus Minnesotensis. O.
70. Pemphigaspis bullata. H.
71. Ptychaspis granulosa. O.
72. P. Barabuensis. Winch.
73. P. Miniscaensis. O.
*74. P. minuta. Whitf.
75. P. sp. undet.
76. Triarthrella auroralis. H.
77. Stromatopora, sp. undet.
77–*a*. Streptelasma, sp. undet.
78. Leptæna (Orthis) Barabuensis. Winch.
79. Straparollus, sp. new.
80. Ophileta uniangulata. H.
81. O. sp. undet. Casts only.
*82. Euomphalus Strongi. Whitf.
83. Raphistoma, sp. undet.
84. R. sp. undet.
85. Holopea, sp. undet. new?
85–*a*. H. (Pleurotomaria) turgida. H.
*86. Scævogyra Swezeyi. Whitf.
*86–*a*. S. elevata. Whitf.
*86–*b*. S. obliqua. Whitf.
*87. Metoptoma primordialis. Whitf.
*88. M. recurva. Whitf.
*88–*a*. M. Barabuensis. Whitf.
*88-*b*. M. retrorsa. Whitf.
89. Bucania, sp. undis.
89–*a*. Orthoceras primigeneum. H.
90. Annelid tubes, Scolithus-like.
91. Leperditia, sp. new.
92. Bathyurus, fragments only.
*93. Illænus antiqatus. Whitf.
*93–*a*. Illænurus convexus. Whitf.
*94. Dicellocephalus Eatoni. Whitf
*95. D. Barabuensis. Whitf.
96. Oolitic bodies, organic?
97. Salterella, sp. new.
98. Triangular, sheath-like bodies.
99. Palæophycus cæspitosum. H.
100. P. gracile. H.
101. P. tubulare. H.
102. P. sp. undet.
102–*a*. Lyrophycus, sp. undet.
103. Cruziana, sp. undet.
104. Buthotrephis succulens. H.
105. Buthotrephis, sp. undet.
106. Phytopsis tubulosa. H.
107. Receptaculites globularis. H.
108. R. Iowensis. O.
109. R. Oweni. H.
110. Astylospongia? sp. undet.
111. Buthograptus laxus. H.
112. Climacograptus typicalis. H.
113. C. sp. undet.

Catalogue A.

114. Dictyonema Neenah. H.
115. Diplograptus Peosta. H.
116. Graptolitic bodies, gen. and sp. undet.
*117. Chætetes annuliferus = Trematopora annulifera. Whitf.
118. Chætetes atritus Nich.
119. C. briareus. Nich.
120. C. discoideus. James.
121. C. Jamesi. Nich.
122. C. lycoperdon. Say.
123. C mammulatus. Nich.
124. C. Ortoni. Nich.
125. C. pavonius. D'Orb.
126. C. polyporus. Whitf.
127. C. pulchellus. Nich.
128. C. punctatus = M. punctata No. 702.
129. C. rhombicus = M. rectangularis No. 701.
130. C. ramosus. D'Orb.
131. C. rugosus. H.
132. C. new and undet. sp.
133. Monticulipora Dalei. E. & H.
134. M. sp. undet.
135. Stellipora polystomella. Nich.
136. S. new sp.
*137. Alveolites irregularis. Whitf.
137-*a*. A. new sp.
138. Dekayi, res. D. aspera. Nich.
139. Streptelasma (Petraia) corniculum. H.
140. S. (Zaphrentis) multilamellosum. H.
141. S. profundum. Con.
142. S. sp. undet.
143. Columnaria alveolata. Goldf.
144. C. sp. undet.
145. Zaphrentis, sp. undet.
146. Coral resembling Calceola.
147. Favosites.
148. Cornulites-like tubes, gen. and sp. undet.
149. Schizocrinus nodosus. H.
150. Poteriocrinus, sp. undet.
151. Cyathocrinus, new sp.
152. Homocrinus, sp. undet.
153. Lichenocrinus, sp. undet.
154. Crinoids, gen. and sp. undet.
155. Pleurocystites squamosus. Bill.
156. Glyptocystites Logani. Bill.
156-*a*. Apiocystites, sp. undet.
157. Trematopora, res. Gorgonia perantiqua. H.
158. T. new and undet. sp.
159. Stictopora elegantula. H.
160. S. fragilis. Bill.
161. S. ramosa. H.
162. S. new sp. Undescribed.
163. S. new sp. "
164. S. new sp. "
165. Ptilodictya recta. H.
166. P. sp. undet.
167. Clathropora flabellata.
168. Callopora, sp. undet.
*169. Fenestella granulosa. Whitf.
170. Retepora, sp. undet.
171. Alecto inflata. H.

Catalogue A.

172. Aulopora arachnoidea. H.
173. Helopora, sp. undet.
174. Paleschara, new sp.
175. Lingula alternata. H.
176. L. Maquoketa. H.
177. L. quadrata = Lingulella Iowensis. O.
178. L. sp. res. L obtusa. H.
179. L. new sp.
180. L. sp. undet.
181. Lingulella? new sp.
182. Pholidops subtruncata. H.
183. Crania scabiosa. H.
184. Crania setigera. H.
185. C. new sp.
186. Schizocrania filosa. H.
187. Monomerella. sp. undescribed.
188. Orthis bellarugosa. H.
189. O. disparalis. Con.
190. O. Ella. H.
191. O. equivalvis. Con.
192. O. Kankakensis. McChes.
193. O. lynx. Eich.
194. O. occidentalis. H.
195. O. pectinella. H.
196. O. perveta. Con.
197. O. plicatella. H.
198. O. subæquata. Con.
199. O. subquadrata. H.
200. O. testudinaria. Dal.
201. O. testudinaria var. Whitf.
202. O. tricenaria. Con.
203. O. hybrida. Dal.?
204. O. borealis. Bill.
205. O. new species.
206. O. sp. undet.
*207. Hemipronites Americanus. Whitf.
208. Streptorhynchus deflectum. Con.
209. S. deltoideum. Con.
210. S. filitextum. H.
211. S. planoconvexum. H.
212. S. planumbonum. H.
213. S. rectum. Con.
214. S. sinuatum. Emmons.
215. S. subtentum. H.
216. S. new sp.
217. Strophomena alternata. Con.
218. S. antiqua. S'by.
219. S. camerata. H.
220. S. camura. Con.
*221. S. Kingi. Whitf.
222. S. incrassata. H.
*223. S. meridionalis. Whitf.
224. S. nitens. Bill.
225. S. recta. Con.
226. S. tenuistriata. S'by.
227. S. tenuilineata. H.
228. S. Thalia. Bill.
229. S. new sp.
229-*a*. S. new sp.
230. S. sp. undet.

Catalogue A.

231. Stophodonta, sp. undet.
232. Leptæna sericea. S'by.
233. Zygospira modesta. H.
234. Z. recurvirostra. H.
235. Atrypa bisulcata. Emmons.
236. Rhynchonella Anticostensis. Bill.
237. R. capax. Con.
238. R. Janea. Bill.
239. R. new sp.
*240. R. perlamellosa. Whitf.
241. Pentamerus hemiplicatus. H.
242. Pterinea demissa. Con.
243. Ambonychia attenuata. H.
244. A. recta. H.
245. A. lamellosa. H.
246. A. planistriata. H.
247. A. radiata. H.
248. A. new sp.
248-*a*. A. sp. undet.
249. Tellinomya Iphigenia. Bill.
250. T. alta. H.
251. T. lirata.
252. T. levata. H.
253. T. nasuta. Bill.
254. T. ventricosa.
255. T. new and undet. sp.
256. Cypricardites canadensis. Bill.
257. C. Niota. H.
258. C. rectirostris. H.
259. C. rotundatus. H.
260. C. subtruncatus. H.
261. C. ventricosus. H.
*262. C. megambonus Whitf.
263. C. sp. undet.
264. Modiolopsis faba. Con.
265. M. plana. H.
266. M. superba. H.
267. M. undet. and new sp.
267-*a*. Nucula fecunda.
268. Euomphalus. new sp.
269. Ecculiomphalus, undet. sp.
270. Raphistoma lenlicularis. S'by.
271. R. Nasoni. H.
272. Helicotoma planulata, Salt.
273. H. new sp.
274. H. sp. undet.
275. Trochonema ambigua. H.
*276. T. Beloitensis. Whitf.
277. T. umbilicata. H.
*277-*a*. T. Beachi. Whitf.
278. T. res. T. lapicidum. Salt.
279. T. sp. undet.
280. Eunema pagoda. Salt.
281. Pleurotomaria depauperata. H.
282. P. Niota. H.
283. P subconica. H.
284. P. sp. undet.
285. P. res. P. occidentalis. H.
286. Cyclonema percarinata. H.

Catalogue A.

287. Murchisonia bicincta. H.
288. M. bellicincta = M. major. H.
289. M. gracilis. H.
290. M. helicteres. Salt.
291. M. pagoda. Salt.
292. M. percarinata. H.
293. M. serrulata. Salt.
294. M. tricarinata. H.
295. M. new sp.
296. Holopea obliqua. H.
297. H. paludiniformis. H.
298. H. sp. undet.
299. Subulites elongatus. Con.
*300. Clisospira occidentalis. Whitf.
300-*a*. C.? sp. undet.
301. Fusispira elongata. H.
302. F. ventricosa. H.
303. F. new sp.
304. Maclurea Bigsbyi. H.
*305. M. cuneata. Whitf.
*306. M. subrotunda. Whitf.
307. Metoptoma patelliformis. Bill.?
*308. M.? perovalis. Whitf.
309. Bucania bidorsata. H.
*310. B. Buelli. Whitf.
311. B. expansa. H.
312. B. punctifrons. H.
313. B. sp. undet.
314. Bellerophon bilobatus. S'by.
*315. B. Wisconsensis. Whitf.
316. B. sp. undet.
317. Cyrtolites compressus. H.
318. C. Dyeri. H.
319. Conularia Trentonensis. H.
*320. Hyolithes Baconi. Whitf.
321. Pterotheca attenuata. H.
322. Ecculiomphalus undulatus. H.
323. E. new sp.
324. Orthoceras amplicameratum. H.
324-*a*. O. arcuoliratum. H.
325. O. anellum. Con.
326. O. capitolinum. Saff.?
327. O. junceum. H.
328. O. plano convexum. H.
329. O. multicameratum. H.
330. O. vertebrale. H.
331. O. new sp.
332. O. sp. undet.
*333. Ormoceras (Actinoceras) Beloitense. Whitf.
334. O. tenuifilum. H.?
335. O. sp. undet.
336. Endoceras annulatum. H.
*336-*a*. E. subannulatum. Whitf.
337. E. proteiforme. H.
338. E. sp. undet.
339. Cyrtoceras annulatum. H.
340. C. camurum. H.
341. C. corniculum. H.
342. C. Eugium. H.

Catalogue A.

343. Cyrtoceras loculosum. H.
344. C. macrostomum. H.
345. C. Neleum. H.
346. C. sp. undet.
347. C. undes. sp.
*347-*a*. C. planidorsatum. Whitf.
348. Oncoceras Alceum. H.
349. O. abruptum. H.
350. O. Lycum. H.
351. O. Pandion. H.
*351-*a*. O. mumiaforme. Whitf.
352. O. plebium. H.
*352-*a*. O. brevicurvatum. Whitf.
353. O. sp. undet.
354. Ascoceras or Cryptoceras, sp. undet.
355. Gyroceras convolvans. H.
*356. G. duplicostatum. Whitf.
356-*a*. G. sp. new.
357. Gonioceras anceps. H.
358. G. occidentale. H.
359. Lituites occidentalis. H.
360. Robertsoni. H.
361. Gomphoceras, sp. undet.
362. Leperditia fabulites. Con.
363. Illænus crassicauda.
364. I. Iowensis. H.
365. I. ovatus. Con.
366. I. taurus. H.
367. I. sp undet.
368. Asaphus Barrandi. H.
369. A. gigas. DeKay.
370. A. Iowensis. O.
*371. A. triangulatus. Whitf.
372. A. sp. undet.
372-*a*. Bathyurus, new sp.
373. Calymene senaria. Con.
374. Harpes, sp. undet.
375. Dalmania callicephala. H.
376. D. meta. H.
377. Ceraurus pleurexanthemus. Green.
378. Encrinurus, new sp
379. Sphærocephalus? sp. undet.
380. Proetus, sp. undet.
381. Beyrichia, sp. new and undet.
382. Ortonia, new sp.
383. Serpulites tubes.
384. Strophomena crassa. Saff.
385. Rhynchonella, sp. undet.
386. Receptaculites occidentalis. H.
387. Conularia gracilis.
388. Gyroceras, sp. undet.
389. Cyrtolites, sp. undet.
390. Schizocrinus, sp. undet.
391. Ormoceras, sp. new, res O. fusiforme
392. Gyroceras? sp. undet.
393. G. new sp.
394. Lituites, sp. new?
395. Gonioceras, sp. undet.
396. Dalmania?

Catalogue A.

397. Ceraurus hypostoma.
398. Ceraurus?
399. Trilobite fragments.
400. Murchisonia, sp. undet.
401. Monticulipora frondosa. D'Orb.
402. Halysites catenulatus. Linn.
403. Buthotrephis, sp. undet.
404. Receptaculites hemisphericus. H.
405. R. infundibuliformis. H.
406. Stromatopora concentrica. Goldf.
406–*a*. S. small sp.
407. Favosites favosus. Goldf.
408. F. Gothlandicus. Goldf.
409. F. Niagarensis. H.
*410. F. occidens. Whitf.
411. F. striatus. Say.
412. F. sp. new? chætetes-like form.
413. F. sp. new? clavate form.
414. Astrocerium venustum. H.
415. A. constrictum. H.
415–*a*. A. sp. undet.
416. Michelina? sp. undet.
417. Alveolites, sp. undet.
418. Cœnites lunatus. N. & H.
419. Thecla, res. T. minor. Rom.
420. T. res. T. major. Rom.
421. Cladopora reticulata. H.
421–*a*. C. var. with fine cells.
422. Halysites agglomeratus. H.
423. H. catenulatus. Linn.
*424. H. catenulatus var. microporus. Whitf.
425. H. labyrinthicus. Goldf.
426. Heliolites macrostylus. H.
427. H. pyriformis. Guett.
428. H. spinoporus. H.?
429. Syringopora compacta. Bill.
430. S. Dalmani. Bill.
*431. Cystostylus infundibula. Whitf.
432. Syringopora retiformis. Bill.
433. S. verticillata. Bill.
434. S. sp. undet.
435. Diphyphyllum cæspitosum. H.
436. Eridophyllum, sp. undet.
437. Cyathophyllum, sp. undet.
438. Omphyma, sp. undet.
*439. Amplexus annulatus. Whitf.
*440. A. fenestratus. Whitf.
441. A. Shumardi. M.-E.
442. A. sp. undet.
443. Streptelasma calyculum. H.?
444. Zaphrentis gigantea. E. & H.?
445. Z. turbinata. H.
446. Z. sp. undet.
447. Aulacophyllum, sp. undet.
*448. Cyathoxonia Wisconsensis. Whitf.
449. Chonophyllum magnificum. Bill.
450. C. Niagarense. H?
451. C. sp. undet, compound form.
452. C. sp. undet.

Catalogue A.

458. Cystiphyllum Americanum. H.
454. C. Niagarense. H.
455. C. sp. undet.
456. Strombodes pentagonus. Goldf.
457. S. new sp.
* 458. Cystostylus typicus. Whitf.
459. Platycrinus, sp. undet.
460. Stephanocrinus gemmiformis. H.
461. Saccocrinus Christyi. H.
462. S semiradiatus. H.
463. Macrostylocrinus striatus. H.
464. Melocrinus Verneuili.
465. Eucalyptocrinus cælatus. H.
466. E. cornutus. H.
467. E. cornutus var. excavatus. H.
468. E. crassus. H.
469. E. obconicus. H.
470. E. ornatus. H.
471. E. new sp.
472. Glyptocrinus armosus. McC.
473. G. nobilis. H.
474. Lampterocrinus inflatus. H.
475. Glyptaster occidentalis. H.
476. G. pentangularis. H.
477. Rhodocrinus rectus. H.
478. R. sculptilis. H.
479. Cyathocrinus Cora. H.
480. C. pisiformis. Rœmer.
481. C. Waukoma. H.
482. Caryocrinus ornatus. Say.
483. Cryptodiscus.
484. Holocystites abnormis. H.
485. H. alternatus. H.
486. H. cylindricus. H.
487. H. ovatus. H.
488. H. scutellatus. H.
489. H. Winchelli. H.
490. Gomphocystites clavus. H.
491. G. glans. H.
492. Hemicosmites subglobosus. H.
493. Apiocystites imago. H.
494. Echinocystites nodosus. H.
495. Crinocystites ornatus. H.
496. C. new sp.
497. Lichenalia concentrica. H.
498. Sagenella membranacea. H.
499. Fenestella elegans. H.
500. Retopora, sp. undet.
501. Polypora incepta. H.
502. Stictopora, sp. undet.
503. Trematopora, sp. undet.
504. Trematis, sp. undet.
505. Dinobolus Conradi. H.
506. Monomerella prisca. Bill?
507. Trimerella grandis. Bill?
508. Orthis biloba. Linn.
509. O. elegantula. Dal.
510. O. flabellula. S'by.
511. O. hybrida. Dal.
512. O. lynx. Eich.

Catalogue A.

513. Streptorhynchus subplanum. Con.
514. Strophomena patenta. H.
515. S. profunda. Con.
516. S. rhomboidalis. Wahl.
517. S. semifasciata. H.
518. S sp. new.
519. Strophodonta striata. H.
520. Leptæna transversalis. Wahl.
521. Skenidium insignum. H.?
522. Spirifera eudora. H.
523. S. gibbosa. H.
524. S. meta. H.
525. S. Niagarensis. H.
526. S. nobilis. Barr.
527. S. plicatella. S'by.
528. S. plicatella var. radiata. H.
529. S. sp. undet.
530. Meristella Hyale = Charionella Hyale. Bill.
531. Cyrtia myrtia. Bill.
532. Meristina cylindrica. H.
533. M. Maria. H.
534. M. nitida. H.
534–*a*. M. sp. undet.
535. Pentagonia, sp. undet.
536. Nucleospira pisiformis. H.
537. Retzia aprinis = Atrypa and Rhynchonella aprinis. H.
538. R. sp. undet.
539. Atrypa nodostriata. H.
540. A. reticularis. Linn.
541. A. sp. new.
542. Rhynchonella cuneata. Dal.
543. R. Indianensis. H.
544. R. neglecta. H.
545. R. pisum. H. & W.
546. Eichwaldia reticulata. H.
547. Pentamerus bisinuatus. McC.
548. P. fornicatus. H.
549. P. oblongus. Murch.
550. P. pergibbosus. H. & W.
551. P, ventricosus. H.
552. P. sp. undet.
553. P. new sp.
554. Gypidula occidentalis. H.
555. G. multicostata. H.
556. Stricklandinia Galtensis. Bill?
557. S. multilirata. Whitf.
558. S. sp. undet.
559. S. new sp.
560. Leptocœlia planoconvexa. H.
561. L. plicatula. H.
562. Porambonites punctostriata = Orthis punctostriata. H.
564. Pterinea brisa. McC.
565. P. emacerata. H.
566. P. undata. H.
567. Ambonychia acutirostra. H.
568. A. aphea. H.
569. Palæocordia cordiformis. H.
570. Modiolopsis dictæus. H.
571. M. Nilesi = Edmondia Nilesi. W. & M.

Catalogue A.

572. Modiolopsis recta. H.
573. M.? subundata. H.
574. Leptodomus Leidyi = Amphicoelia Leidyi. H.
*575. L. undulatus. Whitf.
576. Schizodus? sp. undet.
577. Cypricardinia arata. H.
578. Megalomus Canadensis. H.
579. Rensellæria. New sp.
580. Platyceras Niagarense. H.
581. Platyostoma Niagarense. H.
*582. Euomphalus macrolineatus. Whitf.
583. E. (Straparollus) mopsus. H.
*584. E. (S.) Racinensis. Whitf.
584–*a*. Pleurotomaria, sp. undet.
585. Straparollus Hippolyte. Bill.
586. S. solarioides. H.
587. S. solarioides. H.?
588. Straparollina, sp. undet.
589. Xenophora, new sp.
590. X? trigonostoma. M.
591. Trochonema Fatua. H.
592. Holopea elevata. H.
593. H. Guelphensis. Bill.
594. H. harmonia. Bill.
595. Cyclonema elevatum. H.
596. C. sp. undet.
597. C. pauper. H.
598. Pleurotomaria axion. H.
599. P. Fatua. H.
600. P. Halei. H.
601. P. Hoyi. H.
602. P. Idia. H.
*603. P. Laphami. Whitf.
604. P. occidens. H.
605. Murchisonia Boydi. H.
606. M. Conradi. H.
*607. M. Chamberlini. Whitf.
608. M. Hercyna. Bill.
609. M. Laphami. H.
610. M. Logani. H.
611. M. longispira. H.
612. M. macrospira. H.
613. M. Mylitta. Bill.
614. M. turritiformis. H.
615. Loxonema Leda. H.
*617. Loxonema magnum. Whitf.
618. Bucania angusta. H.
619. B. trigonostoma. H. & W.
620. Metoptoma, sp. undet.
621. Trochoceras Gebhardi. H.
622. Subulites ventricosus. H.
623. Orthoceras abnorme. H.
624. O. alienum. H.
625. O. annulatum. S'by.
*626. O. Carltonense. Whitf.
627. O. columnare. H.
628. O. crebescens. H.
629. O. Hoyi. McC.
630. O. Laphami. McC.

Catalogue A.

631. Orthoceras medulare. H.
632. O. Niagarense. H.
633. Ormoceras sp. res. O. vertebrale. H.
634. Huronia annulata. H.
635. Discoso us conoideus. H.
636. Gomphoceras scrinium. H.
637. G. septoris? H.
638. G sp. undet.
639. Cyrtoceras arcticameratum. H.
640. C. brevicorne. H.
641. C. Dardanum. H.
642. C. Fosteri. H.
643. C. laterale. H.
644. C. lucillum. H.
*645. C. rectum. Whitf.
646. C.? rigidum. H.
647. C. (Oncoceras) Orcas. H.
648. C. pusillum. H.
*649. Phragmoceras labiatum. Whitf.
650. P. Nestor. H.
*651. P. Hoyi, var. compressum. Whitf.
652. Gyroceras Hercules. W. & M.
653. Trochoceras costatum. H.
654. T. Des Plainense. McC.
655. Lituites Ortoni. M.
656. Nautilus occidentalis. H.
657. N. new sp
660. Leperditia fonticola. H.
661. Illænus armatus.
662. I. Barriensis. Murch?
663. I. cuniculus. H.
664. I. Daytonensis. H. & W.
665. I. imperator. H.
666. I. insignis. H.
667. I. Ioxus. H.
*668. I. pterocephalus. Whitf.
669. I. new sp.
670. I. sp. undet.
671. Calymene Niagarensis. Con.
672. C. Clintoni. H.
673. Phacops, new sp.
674. Dalmania vigilans. H.
675. Ceraurus Niagarensis. H.
676. C. new sp.
677. Encrinurus Nereus. H.
678. E ornatus. H. & W.
679. E. new sp.
680. Lichas breviceps. H.
681. L. phlyctonodes H.
682. Bronteus Acamas. H.
*683. B. Laphami. Whitf.
684. Sphærexochus Romingeri. H.
685. Conulites, new sp.
*686. Zaphrentis Racinensis. Whitf.
687. Crionites?=Lunulites=Pasceolus dactyloides. O.
688. Leptodomus neglectus. McC.
*689. Raphistoma Niagarensis. Whitf.
*690. Holopea magniventra. Whitf.
*691. Murchisonia Chamberlini. Whitf.

Catalogue A.

*692.	Orthoceras Wauwatense.	Whift.
*693.	Cyrtoceras infundibulum.	Whitf.
*694.	Illænus Niagarensis.	Whitf.
695.	Calymene Blumenbachii.	Brong.
696.	Strophomena unicostata.	M. & W.
*697.	Streptorhynchus cardinale.	Whitf.
*698.	S. Wisconsensis	Whitf.
*699.	Rhynchonella Neenah.	Whitf.
*700.	Monticulipora multituberculata.	Whitf.
*701.	M. rectangularis.	Whitf.
*702.	M. punctata.	Whitf.
*703.	Trematopora granulata.	Whitf.
*704.	Fistulipora solidissima.	Whitf.
*705.	F. lens.	Whitf.
*706.	F. rugosa.	Whitf.
*707.	Chætetes fusiformis.	Whitf.
708.	C. No. 7, undes. var.	
709.	C. No. 11, undes. var.	
710.	Camarella Ops.	Bill.?
711.	Orthoceras, sp. undet.	
712.	Orthis, sp. undet.	
713.	Bucania, sp. undet.	
714.	Halysites labyrinthicus.	Goldf.
715.	Favosites, sp. res. Astrocerium.	
716.	Favosites?	
717.	Coral, Zaphrentis?	
718.	Stems of crinoidea.	
719.	Pentamerus simulator.	Whitf.=?P. bisinuatus. McC.
720.	Murchisonia, sp. undet.	
721.	Lingulella Iowensis.	O.=177.
*722.	Lituites multicostatus.	Whitf.
723.	Orthoceras, new sp.	
*724.	Pleurotomaria Laphami.	Whitf.=603.
725.	Polydilasma, sp. undet.	
726.	Diphyphyllum, sp undet.	
726–*a*.	D. sp. undet., small form.	
727.	Fenestella, sp. undet.	
728.	Lichenalia=497.	
729.	Sagenella, coarser than S. membranacea.	
730.	Eucalyptocrinus, sp. undet.	
731.	Crinoidea, gen. and sp. undet.	
732.	Retropora, sp. undet.	
733.	Anastrophia interplicata.	H.
734.	Cyclonema, sp. undet.	
736.	Orthoceras, sp. undet.	
737.	Cyrtoceras, sp. undes., No. 1.	
738.	C. sp. undes., No. 2, oval section.	
739.	C. sp. undes., No. 3, with annular ridges like C. lucillum.	
740.	C. sp. undet.	
741.	Gomphoceras, sp. undet.	
742.	Gomphoceras, ? new sp.	
743.	Phragmoceras, sp. undet.	
744.	Pleurotomaria perlata.	H.
745.	P. Galtensis.	Bill.?
746.	Fenestella, sp. undet.	
747.	Trematopora, sp. undet.	
747–*a*.	Bryozoans, gen. and sp. undet.	
748.	Cyathophyllum.	

Catalogue A.

749. Lingula paliformis. H.
*750. Discina marginalis. Whitf.
751. Orthis impressa. H.
752. O. oblata. H.?
753. O. subcarinata. H.
754. O. hybrida. Dal.?
755. O. propinqua. H.?
756. O. sp. undet.
757. Strophodonta demissa. Con.
758. S. perplana. Con.
759. S. inequistriata. H.
760. Chonetes coronata.
761. C. deflecta. H.?
762. Productella, sp. res. P. spinulicostata. H.
762–*a*. Spirifera, sp. undet.
763. Spirifera angusta. H.?
764. S. (Cyrtina) aspera. H.
765. S. granulifera. H.?
766. S. erutines, var. fornacula. H.
767. S. fornacula. H.
768. S. macronota. H.?
769. S. medialis. H.
770. S. mucronata. Con.
771. S. pennata. O.
772. Spiriferina? zigzag. H.
773. Cyrtina aspera. H.
774. C. Hamiltonensis. H.
775. C. new sp.
776. Trematospira hirsuta. H.
777. Atrypa reticularis. Linn.
778. A. spinosa. H.
779. A. hystrix. H.
780. A. occidentalis. H.
781. Leiorhynchus Kelloggi. H.
782. Meristella nucleolata. H.=Atrypa nucleolata. H.
782–*a*. Meristella or Pentamerus.
783. Pteronites, sp. undet.
784. Palæoneilo constricta. Con.
785. P. emarginata. Con.
*786. P. new sp.=P. nuculiformis. Whitf.
787. Modiomorpha concentrica. Con.
788. M. sp. undet.
789. Petrinea aviculoidea=Megambonia aviculoidea. H.
790. Palæoneilo, sp. undet.
791. Ecculiomphalus=Euomphalus laxus. H.
*792. Gomphoceras breviposticum. Whitf.
*793. G. fusiforme. Whitf.
794. G. sp. undet.
795. Orthoceras, sp. undet.
796. Phacops rana. Green.
*797. Rhynchodus excavatus. Newb.
798. Plate of Placyderm.
799. Sphenothallus, sp. undet.
800. Inacaulis, sp. undet.
801. Leperditia alta. Con.
802. Leperditia alta. Con.
803. Pleurotomaria micula. H.
804. Cleidophorus neglectus.
805. Ctenodonta, sp. undet.

Catalogue A.

806. Maclurea, new sp.
807. Ceraurus prolificus. H.?

The following unnumbered species were placed in the collection of type specimens, which was sent to the Wisconsin Academy of Sciences.

* Palæophycus plumosum. Whitf.
* Holopea Sweeti. Whitf.
Lingula, sp. undet.
* Conocephalites calymenoides. Whitf.
* C? quadratus. Whitf.
C. species undescribed.
* Ellipsocephalus curtus. Whitf.
* Crepicephalus onustus. Whitf.
* C. Gibbsi. Whitf.
* Ptychaspis striata. Whitf.
P. sp. new.
P. young of No. 1. See report on Paleontology.
Cheek of trilobite, new species.

Catalogue B.

CATALOGUE B.

LIST OF THE LOCALITIES AND FORMATIONS FROM WHICH THE SPECIMENS DISTRIBUTED DURING THE PRESENT YEAR WERE COLLECTED.

The numbers given in this catalogue correspond to those on the *red* tickets attached to the specimens. The name of the collector or donor, and in a few cases, for special reasons, the name of the specimen is given. In general, the name of the specimen will be found by consulting the preceding list.

No. 1. Potsdam formation, Osceola Mills. T. C. C., coll.
2. Potsdam formation, Hudson; from below the trilobite layer. L. C. Wooster, coll.
3. Potsdam formation, Hudson; from the lower trilobite layers. L. C. Wooster, coll.
4. Potsdam formation, Hudson; from the upper trilobite layers. L. C. Wooster, coll.
5. Potsdam formation, Hudson; from bluff. L. C. Wooster, coll.
6. Potsdam formation, Hudson; near the livery stable. L. C. Wooster, coll.
7. Potsdam formation, Hudson. L. C. Wooster, coll.
8. Potsdam formation, Knapp's Station. L. C. Wooster, coll.
9. Potsdam formation, Willow River Falls, Lithological specimens. L. C. Wooster, coll.
10. Potsdam formation, Robert's Store. L. C. Wooster, coll.
11. Potsdam formation, Menomonie. L. C. Wooster, coll.
12. Potsdam formation, Menomonie Reservoir. L. C. Wooster, coll.
13. Potsdam formation, Menomonie; forty rods below the bridge. L. C. Wooster, coll.
14. Potsdam formation, Somerset P. O. L. C. Wooster, coll.
15. Potsdam formation, St. Croix Falls. L. C. Wooster, coll.
16. Potsdam formation, Taylor's Falls. L. C. Wooster, coll.
16–*a*. Potsdam formation, Taylor's Falls, Chisago Co., Minn. M. Strong, coll.
17. Potsdam formation, Chimney Rock. L. C. Wooster, coll.
18. Potsdam formation, Blew's Mills. L. C. Wooster, coll.
19. Potsdam formation, Eau Claire. L. C. Wooster, coll.
20. Lower Magnesian, Jewett's Mills, L. C. Wooster, coll.
21. Lower Magnesian, Knapp's Station. L. C. Wooster, coll.
22. Lower Magnesian, Town 28, R. 18 W., also specimens from Trenton L., Sec. 1. L. C. Wooster, coll.
23. Lower Magnesian, Wilson Station. L. C. Wooster, coll.
24. Trenton formation, Hudson. L. C. Wooster, coll.
25. Trenton formation, Troy. L. C. Wooster, coll.

Catalogue B.

No. 26. Trenton formation, Town 28, R. 19 W. L. C. Wooster, coll.
27. Trenton formation, Town 28?, R. 19 W. L. C. Wooster, coll.
28. Trenton formation, Town 26, R. 18 W., Trimbelle. L. C. Wooster, coll.
29. Trenton formation, Twin Lakes. L. C. Wooster, coll.
30. Potsdam formation, locality unknown. L. C. Wooster, coll.
31. Potsdam formation, Berlin. T. C. C., coll.
31-*a*. Lower Magnesian, between Berlin and Ripon, near R. R. crossing. T. C. C., coll.
31-*b*. Potsdam formation, Berlin, Sec. 15, S. W. ¼. T. C. C., coll.
31-*c*. Potsdam formation, Berlin, Sec. 15, S. E. ¼. T. C. C., coll.
32. Potsdam formation, Kingston. T. C. C., coll.
32-*a*. Potsdam formation, Kingston, Bartholemew's Bluff; layer No. 3. T. C. C., coll.
32-*b*. Potsdam formation, Kingston, Bartholemew's Bluff; layer No. 9. T. C. C., coll.
32-*c*. Potsdam formation, Kingston, Bartholemew's Bluff; layer No. 11. T. C. C., coll.
32-*d*. Potsdam formation, Kingston, Bartholemew's Bluff; layer No. 15. T. C. C., coll.
32-*e*. Potsdam formation, Kingston, Bartholemew's Bluff; layer No. 18. T. C. C., coll.
32-*f*. Potsdam formation, Kingston, Bartholemew's Bluff; layer No. 17. T. C. C., coll.
32-*h*. Potsdam formation, Kingston, Bartholemew's Bluff; Sec. 14. T. C. C., coll.
32-*i*. Potsdam formation, Kingston, Bartholemew's Bluff; concretions. T. C. C., coll.
33. Potsdam formation, Ironton. I. A. Lapham, coll.
33-*a*. Potsdam formation, Princeton, Green Lake, Sec. 36. T. C. C., coll.
33-*b*. Potsdam formation, Princeton, Green Lake, Sec. 29. T. C. C., coll.
33-*c*. Potsdam formation, Mendota Limestone, Princeton, Sec. 31. T. C. C., coll.
34. Potsdam formation, Muscoda. I. A. Lapham, coll.
35. Potsdam formation, Peshtigo T. C. C., coll.
35-*a*. Potsdam formation, Peshtigo R., Sec. 12, T. 31, R. 20 E. T. C. C., coll.
36. Potsdam formation, Jackson Co. I. A. Lapham, coll.
37. Potsdam formation, Lucas Point, T. C. C., coll.
38. Potsdam formation, Hudson. T. C. C., coll.
39. Potsdam formation, Lone Rock Bluff. L. C. W., coll.
40. Lower Magnesian, Oconto Falls. T. C. C., coll.
40-*a*. Lower Magnesian, Oconto Falls, layer 5. T. C. C., coll.
40-*b*. Lower Magnesian, Oconto Falls, layer 6. T. C. C., coll.
40-*c*. Lower Magnesian, Oconto Falls, layer 8. T. C. C., coll.
41. Lower Magnesian, Hortona. T. C. C., coll.
41-*a*. Lower Magnesian, Grand Rapids, Menomonee Riv. T. C. C., coll.
41-*b*. Lower Magnesian. Sec. 12, T. 32, R. 22 E. T. C. C., coll.
41-*c*. Potsdam Sandstone, Hortona. T. C. C., coll.
42. Lower Magnesian, Caledonia. T. C. C., coll.
42-*a*. Lower Magnesian, Caledonia, Sec. 14. T. C. C., coll.
42-*b*. Lower Magnesian, Caledonia, Sec. 11. T. C. C., coll.
43. Lower Magnesian, Shawano county. T. C. C., coll.
43-*a*. Lower Magnesian, Shawano, Sec. 2, T. 26, R. 16 E. T. C. C., coll.
43-*b*. Lower Magnesian, Shawano, Sec. 4, T. 26, R. 16 E. T. C. C., coll.

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No. 43–*c*. Lower Magnesian, Shawano county, Sec. 34, T. 27, R. 16 E. T. C. C., coll.
43–*d*. Lower Magnesian, Shawano county, S. E. qr. Sec. 4, T. 26, R. 17 E. T. C. C., coll.
44. Lower Magnesian, Winneconne. T. C. C., coll.
44–*a*. Lower Magnesian, Mukwa, Waupaca county. T. C. C., coll.
44–*b*. Lower Magnesian, Poygan, Sec. 26, T. 19, R. 14 E. T. C. C., coll.
44–*c*. Lower Magnesian, Poygan, Sec. 26, T. 19, R. 14 E., layer 2. T. C. C., coll.
44–*d*. Lower Magnesian, Argillaceous limestone, Poygan, Sec. 26, T. 19, R. 14 E. T. C. C., coll.
45. Trenton formation, Mackford. T. C. C., coll.
46. Trenton formation? Audway's ledge. T. C. C., coll.
46–*a*. Lower Magnesian, North Mesquito Hill, S. E. ¼ of S. E. ¼ Sec. 8, T. 22, R. 15. T. C. C., coll.
47. Lower Magnesian, Mosquito Hill. T. C. C., coll.
47–*a*. Lower Magnesian, Liberty, 5th layer, S. E. ¼ Sec. 17, T. 22, R. 15. T. C. C., coll.
47–*b*. Lower Magnesian, Liberty, 4th layer, S. E. ¼ Sec. 17, T. 22, R. 15. T. C. C., coll.
47–*c*. Lower Magnesian, Liberty, 2d layer, S. E. ¼ Sec. 17, T. 22, R. 15. T. C. C., coll.
47–*d*. Lower Magnesian, Liberty, 1st layer, S. E. ¼ Sec. 17, T. 22, R. 15. T. C. C., coll.
47–*e*. Lower Magnesian, Liberty, 3d layer, S. E. ¼ Sec. 17, T. 22, R. 15. T. C. C., coll.
48. Trenton formation, Beloit. T. C. C., coll.
48–*a*. Trenton formation, Beloit; Lee's farm. Mr. Lee, coll.
49. Trenton formation, Hortona. T. C. C., coll.
50. Potsdam formation, Arcadia P. O. L. C. Wooster, coll.
51. Potsdam formation, Ettrick. L. C. Wooster, coll.
52. Potsdam formation, locality ?. L. C. Wooster, coll.
53. Potsdam formation, Rock Falls. L. C. Wooster, coll.
54. Formation? Mt. Tabor, Vernon Co. L. C. Wooster, coll.
55. Trenton formation, Blue Limestone, Lucas, Dunn Co. L. C. Wooster, coll.
56. Trenton formation, Brodhead. T. C. C., coll.
57. Trenton formation, Janesville. T. C. C., coll.
58. Trenton formation, 1½ miles W. of Janesville. T. C. C., coll.
59. Trenton formation, Monticello. T. C. C., coll.
60. Trenton formation, Indian Ford. T. C. C., coll.
61. Trenton formation, Fulton, T. C. C., coll.
62. Trenton formation, Union. T. C. C., coll.
62–*a*. Trenton formation, Union Mills, Carver's Quarry. ——, coll.
63. Trenton formation, Fitchburg. R. D. Irving, coll.
64. Trenton formation, Oakland. T. C. C., coll.
65. Trenton formation, Oakland, Sec. 31. T. C. C., coll.
66. Trenton formation, Aztalan. T. C. C., coll.
67. Trenton formation, Burke. R. D. Irving, coll.
68. Trenton formation, Madison, 1874. I. A. Lapham, coll.
68–*a*. St. Peters? Shaly Sandrock, Portland. T. C. C., coll.
68–*b*. St. Peters, Portland. T. C. C., coll.
69. Trenton formation, Waterloo. T. C. C., coll.
69–*a*. St. Peters formation, Conglomerate, Waterloo, Sec. 24. T. C. C., coll.
70. Trenton formation, Elba. T. C. C., coll.
71. Trenton formation, Calamus. T. C. C., coll.
72. Trenton formation, Ripon, Corliss' Quarry. T. C. C., coll.

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No. 73. Trenton formation, Ripon, Coombs' Quarry. T. C. C., coll.
74. Trenton formation, Ripon, S. E. ¼ of N. W. ¼, Sec. 20. T. C. C., coll.
74–*a*. St. Peters, near junction, Ripon. T. C. C., coll.
75. Trenton formation, Ripon, Quarry 1½ miles W. of town. T. C. C., coll.
76. Trenton formation, 2d Quarry west of Camp, Ripon. T. C. C., coll.
77. Trenton formation, Ripon; specimens found in road W. of town, by Mr. Starr.
78. Trenton formation, Ripon, Quarry No. 1. T. C. C., coll.
79. Trenton formation, Ripon. T. C. C., coll.
79–*a*. Lower Magnesian, Ripon, Quarry by lime kiln, Mrs. Starr's lot. T. C. C., coll.
80. Trenton formation, Ripon Falls. T. C. C., coll.
81. Lower Magnesian, on road N. of Ripon. T. C. C., coll.
82. Trenton formation, Ripon, S. W. ¼, Sec. 5. T. C. C., coll.
83. Trenton formation, Ripon; near lime kiln. T. C. C., coll.
83–*a*. Lower Magnesian, Ripon; Mrs. Starr's lot. T. C. C., coll.
84. Trenton formation, Ripon, Sec. 6. T. C. C., coll.
85. Trenton formation, Portland. T. C. C., coll.
86. Trenton formation, Center. T. C. C., coll.
87. Trenton formation, Pensaukee. T. C. C., coll.
88. Trenton formation, Ellington. T. C. C., coll.
89. Trenton formation, Ellington, Sec. 25. T. C. C., coll.
90. Lower Magnesian, Ellington, Sec. 15. T. C. C., coll.
91. Lower Magnesian, Ellington, Sec. 24. T. C. C., coll.
92. Lower Magnesian, Ellington, Sec. 22. T. C. C., coll.
93. Trenton formation, Ellington, Sec. 29. T. C. C., coll.
94. Potsdam Sandstone? Ellington, Sec. 17. T. C. C., coll.
95. Trenton formation, Menomonee R., 6 miles above Marinette; Sec. 13, T. 31, R. 21. T. C. C., coll.
96. Trenton formation, Magnolia. T. C. C., coll.
96–*a*. St. Peters formation, Magnolia. T. C. C., coll.
97. Trenton formation, Osborn. T. C. C., coll.
98. Galena Limestone, Freeport, Ill. Moses Strong, coll.
99. Galena Limestone, Rockford, Ill. T. C. C. coll.,
100. Galena Limestone, Warren, Ill. Moses Strong, coll.
101. Galena Limestone, R. R. cut, E. of Beloit, Wis. T. C. C., coll.
102. Galena Limestone, Sharon. T. C. C., coll.
103. Trenton formation, Turtleville. T. C. C., coll.
104. Galena Limestone, Allens Grove. I. A. Lapham, coll.
105. Cincinnati Group, near Shullsburg. M. Strong, coll.
105–*a*. Galena Limestone, Shullsburg. M. Strong, coll.
106. Galena Limestone, Bradford. T. C. C., coll.
107. Trenton formation, Harmony. T. C. C., coll.
108. Trenton formation, Mineral Point. I. A. Lapham, coll.
109. Trenton formation, Darlington. I. A. Lapham, coll.
110. Galena Limestone, Whitewater. T. C. C., coll.
111. Galena Limestone, West Jefferson. T. C. C., coll.
112. Galena Limestone, Emmett. T. C. C., coll.
113. Galena Limestone, Waupun, Poisson's Quarry. T. C. C., coll.
114. Trenton formation, Beaver Dam. T. C. C., coll.
115. Galena Limestone, Oshkosh, upper layer, W. Quarry. T. C. C., coll.
116. Galena Limestone, Fond du Lac. T. C. C., coll.
117. Galena Limestone? Ripon. T. C. C., coll.
118. Lower Magnesian? Green Lake. T. C. C., coll.

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No. 118–*a*. Potsdam Sandstone, N. side of Green Lake, ½ N. W. of Sherwood House. T. C. C., coll.
119. Galena Limestone, Oshkosh, lower layers, W. Quarry. T. C. C., coll.
120. Galena Limestone, Oshkosh, E quarry. T. C. C., coll.
121. Galena Limestone, Oshkosh, W. W. Wright's. T C. C., coll.
122. Galena formation, Green Bay, S. of Pensaukee. T. C. C., coll.
123. Galena Limestone, Neenah, Mitchell's Quarry, Sec. 34. T. C. C., coll.
124. Trenton formation, Neenah, Thompson's Quarry, Sec. 29. T. C. C, coll.
125. Trenton formation, Neenah, Draw's Quarry, Sec. 24. T. C. C., coll.
126. Trenton formation, Menasha, Sec. 17. T. C. C., coll.
127. Galena Limestone, Menasha, Sec. 5. T. C. C., coll.
128. Galena Limestone, Menasha, Sec. 11. T. C. C., coll.
129. Galena Limestone, Appleton. T. C. C., coll.
130. Galena Limestone, Little Chute. T. C. C., coll.
131. Galena Limestone, Kaukauna. T. C. C., coll.
132. Galena Limestone, Duck Creek, R. R. crossing. T. C. C., coll.
133. Galena Limestone, Freedom, 3 miles below Duck Creek. T. C. C., coll.
134. Galena Limestone, Flintville, Oconto Co. T. C. C., coll.
135. Galena Limestone, Big Suamico. T. C. C., coll.
136. Galena Limestone, Little Suamico. T. C. C., coll.
137. Galena Limestone, Bay Shore, S. of Pensaukee. T. C. C., coll.
138. Galena Limestone, Lower Menomonee Dam. T. C. C., coll.
138–*a*. Galena Limestone, from near Peshtigo. T. C. C., coll.
139. Trenton formation, Newark, Sec. 11. S. W. ¼. T. C. C., coll.
140. Galena formation, Newark, N. W. ¼ Sec. 14. T. C. C., coll.
141. Trenton formation, Newark, N. W. ¼ Sec. 3. T. C. C., coll.
142. Trenton formation, Sec. 4, T. 30, R. 22 E., from well. T. C. C., coll.
143. Trenton formation, Sec. 13, T. 31, R. 22 E., Menomonee Region. T. C. C., coll.
144. Trenton formation, T. 31, R. 21 E., from cellar. T. C. C., coll.
145. Trenton formation, Sec. 34, T. 31, R. 21 E. T. C. C., coll.
145–*a*. St. Peters? Shale, 20 ft. below the junction with Trenton L., Sec. 26, T. 31, R. 21 E. T. C. C., coll.
146. Trenton formation, Newark, Sec. 13, center of W. ½. T. C. C., coll.
147. Cincinnati (Hudson River) shales, Palmyra, Garbott's well, S. W. ¼, Sec. 24. T. C. C., coll.
147–*a*. Cincinnati shales, Palmyra, S. E. ¼. Sec. 26, T. 5, R. 16 E. T. C. C., coll.
148. Cincinnati shales, Williamstown, N. E. ¼, Sec. 27, T. 12, R. 16 E T. C. C., coll.
148–*a*. Cincinnati shales, Stockbridge, Sec. 2, T. 19, R. 18; lake shore. T. C. C., coll.
148–*b*. Cincinnati shales, Stockbridge, Sec. 11, T. 19, R. 18; lake shore. T. C. C., coll.
148–*c*. Cincinnati shales, Stockbridge, Sec. 24, T. 19, R. 18 E. T. C. C., coll.
149. Cincinnati shales, Delafield, Sec. 24; Roberts' Quarry. T. C. C., coll.
150. Cincinnati shales, Delafield, Sec. 24; Roberts' Quarry. T. C. C., coll.
151. Cincinnati shales, Iron Ridge; from well. T. C. C., coll.
151–*a*. Niagara limestone, Iron Ridge; above ore bed. T. C. C., coll.

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No. 152. Cincinnati shales, Iron Ridge? T. C. C., coll.
153. Cincinnati shales, Lebanon, Sec. 1, T. 9, R. 16 E. T. C. C., coll.
154. Cincinnati shales, Herman, Sec. 5, T. 11, R. 17 E. T. C. C., coll.
155. Cincinnati shales, Hartford, Blossom's well. T. C. C., coll.
156. Cincinnati shales, Hartford. T. C. C., coll.
157. Cincinnati shales, Iron Ridge Village. T. C. C., coll.
158. Cincinnati shales, Iron Ridge, near R. R. track, S. of furnace. T. C. C., coll.
159. Cincinnati shales, Iron Ridge, near furnace. T. C. C., coll.
160. Cincinnati shales, Iron Ridge, N. of furnace. T. C. C., coll.
162. Hamilton Cement Rock; Brown bed, Milwaukee. T. C. C., coll.
163. Hamilton Cement Rock, Milwaukee, Washington St. Bridge. T. C. C., coll.
164. Hamilton Cement Rock, White Fish Bay, Mil. Co. T. C. C., coll.
165. Hamilton Cement Rock, Granville, Sec. 10, near church. T. C. C., coll.
166. Lower Helderberg? Mud Creek, Milwaukee Co. T. C. C., coll.
167. Niagara formation, Racine Limestone, Horlick's Quarry, Root R. Rapids, Racine. I. A. Lapham, coll.
168. Niagara formation, Racine L., Racine, T., C. C., coll.
169. Cincinnati shales, Stockbridge, lot 59. T. C. C., coll.
170. Cincinnati shales, Delafield. T. C. C., coll.
171. Lower Helderberg? Waubakee, mid. E. ½ Sec. 29. T. C. C., coll.
172. Lower Helderberg? Waubakee, R. bottom. T. C. C., coll.
173. Lower Helderberg? Waubakee, 1 mile above village. T. C. C., coll.
174. Lower Helderberg? Waubakee, river bottom. T. C. C., coll.
175. Lower Helderberg? beds below Hamilton; Washington St. Bridge, Sec. 5, T. 7, R. 22. T. C. C., coll.
176. Cincinnati Shales, Eagle, Waukesha Co., S. E. ¼ Sec. 9. T. C. C., coll.
177. Niagara formation, Port Washington, bed of river, Racine beds. T. C. C., coll.
178. Niagara formation, Eagle, N. W. ¼ Sec. 10, Mayville beds. T. C. C., coll.
179. Niagara formation?, Eagle, T. 5, R. 17 E. T. C. C., coll.
180. Niagara formation, Eagle, S. W. ¼ Sec. 10, Mayville beds. T. C. C., coll.
181. Niagara formation, 2 miles S. of Little Sturgeon Bay. T. C. C., coll.
182. Niagara formation, Little Sturgeon Bay, Clinton beds. T. C. C., coll.
183. Niagara formation, Sec. 2, T. 27, R. 24, Clinton beds, 4 feet below the cherty layer. T. C. C., coll.
184. Niagara formation, Hartford, Blodgett's farm, Mayville beds. T. C. C., coll.
185. Niagara formation, Ottawa, S. E. ¼ Sec. 11, Mayville beds. T. C. C., coll.
186. Niagara formation, Delafield, Audley's Quarry, S. E. ¼ Sec. 20, Mayville beds. T. C. C., coll.
186–*a*. Niagara formation, Delafield, chert nodules, burned, Audley's Quarry. T. C. C., coll.
187. Niagara formation, Taycheedah, S. W. ¼ Sec. 32, Mayville beds, concretionary and granular layers. T. C. C., coll.
187–*a*. Cincinnati shales, Taycheedah, N. W. ¼ Sec. 21, iron pyrites. T. C. C., coll.
188. Niagara formation, Taycheedah, N. W. ¼ Sec. 10, Mayville beds. T. C. C., coll.

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No. 189. Niagara formation, Williamstown, W. line S W. ¼ Sec. 30, Mayville beds. T. C. C., coll.
190. Niagara formation, Byron, Sec. 10, Byron beds. T. C. C, coll.
191. Niagara formation, Byron, Sec. 34, Mayville beds. T. C. C., coll.
192. Niagara formation, Mayville, above Ore beds, Mayville beds. T. C. C., coll.
193. Niagara formation, Byron, S. W. ¼ Sec. 20, Mayville beds. T. C. C., coll.
194. Niagara formation, Hubbard, S. W. ¼ Sec. 1, Mayville beds. T. C. C., coll.
195. Niagara formation, Pewaukee, Pelton's Quarry, just above blue layers, Waukesha beds. T. C. C., coll.
196. Niagara formation, Pewaukee village, Waukesha beds. T. C. C., coll.
197. Niagara formation, Pewaukee, Waukesha beds. T. C. C., coll.
198. Niagara formation, Delafield village, S. W. ¼ Sec. 17, Mayville beds. T. C. C., coll.
199. Niagara formation, Pewaukee, Goodyear's Quarry, S. 19, T. 7, R. 19, Mayville beds. T. C. C., coll.
200. Niagara formation, Pewaukee Quarry, Waukesha beds. T. C. C., coll.
201. Niagara formation, Spring Prairie (Voree's), S. E. ¼ Sec. 25, Racine beds? T. C. C., coll.
202. Niagara formation, Wauwatosa, Busack's Quarry, Racine beds. T. C. C., coll.
203. Niagara formation, Wauwatosa, Schoonmaker's Quarry, Racine beds. T. C. C., coll.
204. Niagara formation, Wauwatosa, Story's Quarry, Racine beds. T. C C., coll.
205. Niagara formation, Wauwatosa, Busack's Quarry, layers 1 and 2, Racine beds. T. C. C., coll.
206. Niagara formation, Wauwatosa, Zimmerman's Quarry, N. E. ¼ Sec. 7, Racine beds. T. C. C., coll.
207. Niagara formation, Pewaukee, N. side of mound, Waukesha beds. T. C. C., coll.
208. Niagara formation, Genesee, Johnson's Quarry, Waukesha beds. T. C. C., coll.
209. Niagara formation, Wauwatosa, Racine beds. T. C. C., coll.
210. Niagara formation, Wauwatosa, Schoonmaker's Quarry, Racine beds. T. C. C., coll
211. Niagara formation, Waukesha, lower layers. T. C. C., coll.
212. Niagara formation, Milwaukee, Hawley's Quarry, Racine beds. T. C. C., coll.
213. Niagara formation, Wauwatosa, Swickhart's Quarry, Racine beds. T. C. C., coll.
214. Niagara formation, Menomonee Falls, Sec. 3, Racine beds. I. A. Lapham, coll.
215. Niagara formation, Waukesha Quarry. T. C. C., coll.
216. Niagara formation, Menomonee, Sec. 8, T. 8, R. 20, Racine beds. T. C. C., coll.
217. Niagara formation, Waukesha, 1st Q. N. of city, Racine beds.? T. C. C., coll.
218. Niagara formation, Waukesha. Probably I. A. Lapham, coll.
219. Niagara formation, Milwaukee, John Reynolds' Quarry, S. E. ¼ Sec. 6, T. 6, R. 22 E. T. C. C., coll.
220. Niagara formation, Milwaukee, Moody's Quarry, S. W. ¼ Sec. 30, T. 7, R. 22, Racine beds. T. C. C., coll.
221. Niagara formation, Granville, Sec. 29, middle of N. line, Guelph beds. T. C. C., coll.

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No. 222. Niagara formation, Granville, Sec. 29, N. E. ¼ Guelph beds T. C. C., coll.
223. Niagara formation, Germantown, Sec. 25, S W. ¼ S. line, Racine beds, south side of road. T. C. C., coll.
224. Niagara formation, Grafton, Sec. 25, E. bank of Mil. R., Guelph beds. T. C. C., coll.
225. Niagara formation, Cedarburg, Sec. 26, Guelph beds? T. C. C., coll.
226. Niagara formation, Cedarburg, Sec. 24, Guelph beds? T. C. C., coll.
227. Niagara formation, Cedarburg, R. R., S. E. ¼ of N. W. ¼ Sec. 25, Guelph beds. T. C. C., coll.
228. Niagara formation, Cedarburg, middle W. ½ Sec. 35, Guelph. beds. T. C. C., coll.
229. Niagara formation, Cedarburg, S. W. ¼ Sec. 35, Guelph beds. T. C. C., coll.
229-*a*. Niagara formation, Cedarburg, building stone, Racine beds. T. C. C., coll.
230. Niagara formation, Saukville, Sec. 26, Guelph beds. T. C. C., coll.
231. Niagara formation, Menomonee Falls, Sec. 9, Racine beds. T. C. C., coll.
231-*a*. Niagara formation, Menomonee, Sec. 8, Racine beds. T. C. C., coll.
232. Niagara formation, Pewaukee, Harlan's Quarry, Sec. 12, Waukesha beds. T. C. C., coll.
233. Niagara formation, Grafton bridge, Guelph beds. T. C. C., coll.
233-*a*. Niagara formation, Grafton, specimens for analysis, Guelph beds, E. bank of Mil. R., S E. ¼ Sec. 24. T. C. C., coll.
234. Niagara formation, Pt. Washington, Dreucker's Quarry, Guelph beds. I. A. Lapham, coll.
234-*a*. Niagara formation, Mequon, Sec. 17, T. 9, R. 22 E., Guelph beds. T. C. C., coll.
235. Niagara formation, near Port Washington, Guelph beds. I. A. Lapham, coll.
236. Devonian? Port Washington, above Dreucker's Quarry. I. A. Lapham, coll.
237. Niagara formation, Pewaukee, Sec. 26, Racine beds. T. C. C., coll.
238. Niagara formation, Young America, T. 11, R. 19 E., Sec. 2, Racine beds. T. C. C., coll.
239. Niagara formation, Sheboygan Falls, Sec. 17, Guelph beds, Howard's Quarry. T. C. C., coll.
239-*a*. Niagara formation, Sheboygan Lighthouse, Guelph beds. T. C. C., coll.
240 Niagara formation, N. E. ¼ Sec 12, Trenton, Racine beds. T. C. C., coll.
241. Cincinnati shales, Mukwonago, drift, Sec. 11. T. C. C., coll.
242. Niagara formation, Menomonee, Howard's Quarry, Racine beds T. C. C., coll.
243. Niagara formation, Sheboygan Center, Sec. 9, Roth's Quarry, Guelph beds. T. C. C., coll.
244. Niagara formation, Newburg. T. C. C., coll.
245. Niagara formation, Rhine, Sec. 18, S. W. ¼, Lower coral beds. T. C. C., coll.
246. Niagara formation, Rockville, Manitowoc county. T. C. C., coll.
247. Niagara formation, Sheboygan, N. ½ Sec. 7, Rabie's Quarry, Guelph beds. T. C. C., coll.
247-*a*. Drift, Sheboygan, Rabie's Quarry, Gypsum and associated rock. T. C. C., coll.

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No. 248. Niagara formation, Manitowoc Rapids, S. E. ¼ Sec. 10, Racine beds. T. C. C., coll.
249. Niagara formation, Nashoto, Jones' Quarry, Racine beds. T. C. C., coll.
250. Niagara formation, Carlton, N. E. ¼ Sec. 6, Racine beds. T. C. C., coll.
251. Niagara formation, Carlton, N. W. ¼ Sec. 28, Guelph beds. T. C. C., coll.
252. Niagara formation, Kewaunee, S. E. ¼ Sec. 14, Racine beds. T. C. C., coll.
253. Niagara formation, Kewaunee, S. W. ¼ Sec. 14, lower layers, Upper Coral beds. T. C. C., coll.
254. Niagara formation, Kewaunee, S. E. ¼ Sec. 14, Pentamerus layers, Racine beds. T. C. C., coll.
255. Niagara formation, Franklin, Sec. 3, T. 5, R. 21 E., Racine beds. T. C. C., coll.
256. Niagara formation, Scarboro creek, W. ½ Sec. 30, T. 24, R. 24, Upper Coral beds. T. C. C., coll.
257. Niagara formation, Pierce, N. E. ¼ Sec. 32, Upper Coral beds. T. C. C., coll.
258. Niagara formation, Sturgeon Bay, E. Shore, Sec. 9, T. 27, R. 26, Upper Coral beds. T. C. C., coll.
259. Niagara formation, Sturgeon Bay, E. Shore, Sec. 5, T. 27, R. 26, Upper Coral beds. T. C. C., coll.
260. Niagara formation, Sturgeon Bay, field E. of mill, Lower Coral beds. T. C. C., coll.
261. Niagara formation, Sturgeon Bay, high hill N. W. of South Bay. T. C. C., coll.
262. Niagara formation, Sturgeon Bay, S. W. side of mouth, Lower Coral beds. T. C. C., coll.
263. Niagara formation, Sturgeon Bay, N. E. ¼ Sec. 34. T. C. C., coll.
263–*a*. Drift N. of Little Sturgeon Bay, Carbonaceous Shale. T. C. C., coll.
264. Niagara formation, Pierce, Sec. 28, near center, Upper Coral beds. T. C. C., coll.
265. Niagara formation, Forrestville, S. W. ¼ Sec. 17, Greening's Ledge, L. Coral beds. T. C. C., coll.
265–*a*. Niagara, Forrestville, Martin Miller's Q. T. C. C., coll.
266. Niagara formation, Sturgeon Bay, S. E. ¼ Sec. 9, T. 27, R. 26 E., Racine beds. T. C. C., coll.
267. Niagara formation, Bailey's Harbor, Upper Coral beds. T. C. C., coll.
268. Niagara formation, Point du Morts, L. Mich. Shore, U. Coral beds. T. C. C. coll.
269. Niagara formation, South of Egg Harbor, Pentamerus layers. T. C. C., coll.
270. Niagara formation, Montpelier, Sec. 25, near center Racine beds. T. C C., coll.
271. Niagara formation, Montpelier, S. W. ¼ Sec. 13, Racine beds.
272. Niagara formation, Franklin, middle E. line N. E. ¼ Sec. 15, Coral beds. T. C. C., coll.
273. Niagara formation, Kewaunee Ledge, N.W. ¼ Sec. 5, Racine beds. T. C C., coll.
274. Niagara formation, Kewaunee, Sec. 31, N. E. cor., Upper Coral beds. T. C. C., coll.
275. Niagara formation, Kewaskum, N. W. ¼ N. W. ¼ Sec. 32. T. C. C., coll.
276. Niagara formation, Gibson, N. line, N. E. ¼ Sec. 1, Racine beds. T. C. C., coll.

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No. 277. Niagara formation, Cato, N. W. ¼ of N. E. ¼ Sec. 5, N. outcrop on Mrs. Meony's, Lower Coral beds. T. C. C., coll.

278. Niagara formation, Cato, S. W. ¼ of N. W. ¼, Sec. 5, S. outcrop on Mrs. Meony's, Lower Coral beds. T. C. C., coll.

279. Niagara formation, Cooperstown, Sec. 13, near center, Lower Coral beds. T. C. C., coll.

280. Niagara formation, Manitowoc Rapids, Vilas outcrop, W. line S. W. ¼ Sec. 10, near rapids. T. C. C., coll.

281. Niagara formation, Manitowoc Rapids, Keuntz outcrop, S. W. ¼ of S. W. ¼ Sec. 10. T. C. C., coll.

282. Niagara formation, Cooperstown Ledge, S. E. ¼ Sec. 13, Lower Coral beds. T. C. C, coll.

283. Niagara formation, Cooperstown Ledge, N. E. ¼ Sec. 25, Lower Coral beds. T. C. C., coll.

284. Niagara formation, Cato, Mendlik's Ledge, S. E. ¼ Sec. 6, Lower Coral beds. T. C. C., coll.

285. Niagara formation, Cato Falls, Upper Coral beds. T. C. C., coll.

286. Niagara formation, Gibson, Jambo Creek, Smith's Ledge, Coral beds. T. C. C., coll.

287. Niagara formation, Cato, Clark's Mills, N. W. ¼ Sec. 27, Upper Coral beds. T. C. C., coll.

288. Niagara formation, Cato, N. E. ¼ Sec. 27, Upper Coral beds. T. C. C., coll.

289. Niagara formation, Gibson, S. E. ¼ Sec. 28, Lower Coral beds. T. C. C., coll.

290. Niagara formation, Rockland Ledge, Middle, S. ½ Sec. 36, Lower Coral beds. T. C. C., coll.

290–*a*. Niagara formation, Richland, S. ½ Sec. 36, diamond drill cores. Also fossils. J. Mendlik, donor.

291. Niagara formation, Ashford, R. R. cut, N. E. ¼ Sec. 11, Coral beds. T. C. C., coll.

292. Niagara formation, Cato, N. W. ¼ N. E. ¼ Sec. 5, Chert layers, Lower Coral beds. T. C. C., coll.

293. Niagara formation, Kossuth, Sec. 14, near mill, Racine beds. T. C. C. coll.

294. Niagara formation, New Cassel, T. 18, R. 19, Coral beds. T. C. C., coll.

295. Niagara formation, Cliff S. of Ellison's Bay, upper layer, Upper Coral beds. T. C. C., coll.

296. Niagara formation, Lake Shore, S. of Jacksonport, Upper Coral beds. T. C. C., coll.

297. Niagara formation, one mile S. of Fish creek, Coral beds. T. C. C., coll.

298. Niagara formation, N. E side of North Bay, Racine beds?. T. C. C., coll.

299. Niagara formation, North Bay, Upper Coral beds. T. C. C., coll.

300. Niagara formation, Ashford, R. R. cut, Sec. 2, Coral beds. T. C. C., coll.

301. Niagara formation, Red River, Sec. 28. T. C. C., coll.

302. Niagara formation, Cato, mills below rapids, Upper Coral beds. T C. C., coll.

302–*a*. Niagara formation, Cato, Lithological specimens, Upper Coral beds. T. C. C., coll.

303. Niagara formation, Kossuth, S. E. cor. Sec. 26 and N. E. cor. Sec. 35, Racine beds. T. C. C., coll.

304. Niagara formation, Green Bay, S. W. ¼ Sec. 14, T. 25, R. 22 E., Mayville beds. T. C. C., coll.
Also Cincinnati fossils, same locality?

Catalogue B.

No. 305. Niagara formation, Mishicott Ledge, S E. ¼ Sec. 6, T. 20, R. 24 E. T. C. C., coll.
306. Niagara formation, Rockland, S. E. ¼ Sec. 4, Lower Coral beds. T. C. C., coll.
307. Niagara formation, Cooperstown, S. line Sec. 35, Lower Coral beds. T. C. C., coll.
308. Niagara formation, Forest, N. E. ¼ Sec. 16, Anton Halfmeyer's Quarry, Lower Coral beds. T. C. C., coll.
309. Cincinnati formation?, Scott, center, S. Line Sec. 12. T. C. C., coll.
310. Niagara formation, Elmore, Ashford, Sec. 23, Coral beds. T. C. C., coll.
311. Niagara formation, Kewaskum, N. W. ¼ Sec. 6, Kuhn's Quarry, Lower Coral beds. T. C. C., coll.
312. Niagara formation, Kewaskum, Kuhn's Q., a few rods from the last, Coral beds. T. C. C., coll.
313. Niagara formation, Granville, N. E. ¼ Sec. 29, De Worth's Quarry, Guelph beds. Dr. I. A. Lapham, coll.
314. Niagara formation, Granville, N. E. ¼ Sec. 29, Guelph beds. Dr. I. A. Lapham, coll.
315. Galena Limestone, Hustisford, Dodge Co. T. C. C., coll.
316. Trenton formation, Fort Atkinson, Krump's Quarry. T. C. C., coll.
317. Niagara formation?, Ashipun, N. W. ¼ Sec. 28. T. C. C., coll.
318. Niagara formation?, Ashipun, N. E. ¼ Sec. 29. T. C. C., coll.
318-*a*. Cincinnati shales, Ashipun, N. W. ¼ Sec. 6. T. C. C., coll.
319. Niagara formation, Ashipun, N. W. ¼ Sec. 7, Ledge, Mayville beds. T. C. C., coll.
320. Niagara formation, Ashipun, Granular layers, Mayville beds. T. C. C., coll.
320-*a*. Niagara formation, Ashipun, Fragmental and breccia layers, Mayville beds. T. C. C., coll.
320-*b*. Niagara formation, Ashipun, Ledge, bottom layer, Mayville beds. T. C. C., coll.
321. Niagara formation, Greenfield, S. W. ¼ Sec. 28, Racine beds. T. C. C., coll.
321-*a*. Niagara formation, S. Milwaukee, J. Reynolds' Quarry, Racine beds. T. C. C., coll.
321-*b*. Niagara formation, Schwartzburg, N. E. corner Sec. 35, Guelph beds. I. A. Lapham, coll.
321-*c*. Niagara formation, Brillion, S. E. ¼ Sec. 34, Byron beds. Dr. McBride, donor.
321-*d*. Niagara formation, S. W. ¼ Sec. 20, J. Steffer's Quarry, Byron beds. T. C. C., coll.
321-*e*. Niagara formation, Oakfield, N. W. ¼ Sec. 34, J. C. Wells' Quarry, Mayville beds. T. C. C., coll.
321-*h*. Niagara formation, Oakfield, center of Sec. 34, Byron beds. T. C. C., coll.
322. Cincinnati Group, Scales Mound, Ill., N. E. ¼ Sec. 26. M. Strong, coll.
323. Trenton formation, S. E. ¼ Sec. 4, T. 1, R. 2 E., Oakland Mine, Blue limestone. M. Strong, coll.
324. Galena Limestone, N. E. ¼ Sec. 23, T. 1, R. 2 E., Remick's Quarry. M. Strong, coll.
325. Cincinnati Shale, S. W. ¼ Sec. 22, T. 1, R. 2 E., Gratiot's Grove. M. Strong, coll.
326. Galena Limestone, S. E. ¼ Sec. 10, T. 1, R. 2 E., Shullsburg. M. Strong, coll.

Catalogue B.

No. 327. Trenton formation, N. E. ¼ Sec. 3, T. 2, R. 3 E., Darlington Quarries. M. Strong, coll.

328. Cincinnati Group, N. E. ¼ Sec. 2, T. 3, R. 1 E., Platte Mound. M. Strong, coll.

329. Trenton formation, N. E. ¼ Sec. 6, T. 4, R. 3 E., Mineral Point, Blue limestone. M. Strong, coll.

330. Trenton formation, S. E. ¼ Sec. 8, T. 4, R. 3 E., Mineral Point, Buff limestone. M. Strong, coll.

331. Trenton formation, N. W. ¼ Sec. 15, T. 4, R. 2 E., Road, Blue limestone. M. Strong, coll.

332. Trenton formation, N. E. ¼ Sec. 36, T. 5, R. 2 E., Mineral Point Quarry, Blue limestone. M. Strong, coll.

333. Trenton formation, S. W. ¼ Sec. 17, T. 5, R. 5 W., Grant county, Blue limestone. M. Strong, coll.

334. Trenton formation, S. W. ¼ Sec. 17, T. 5, R. 5 W., Bed of stream, Blue limestone. M. Strong, coll.

335. Trenton formation, S. W. ¼ Sec. 5, T. 5, R. 5 W., Bed of stream, Blue limestone. M. Strong, coll.

336. Lower Magnesian, Sec. 10, T. 7, R. 5 W., Little Kickapoo. M. Strong, coll.

337. Potsdam formation, N. W. ¼ Sec. 18, T. 8, R. 1 E., Muscoda Quarry. M. Strong, coll.

338. Lower Magnesian, S. E. ¼ Sec. 32, T. 9, R. 1 E. M. Strong, coll.

339. Potsdam formation, N. E. ¼ Sec. 34, T. 9, R. 2 E., Lone Rock Quarry. M. Strong, coll.

340. Lower Magnesian, N. E ¼ Sec. 35, T. 11, R. 3 E. M. Strong, coll.

341. Potsdam formation, Secs. 8, 22 and 25, T. 12, R. 3 E., Ironton. M. Strong, coll.

342. Potsdam formation, N. E. ¼ Sec. 29, T. 19, R. 7 W. M. Strong, coll.

343. Potsdam formation, ¼ post Secs. 33 and 34, T. 20, R. 8 W. M. Strong, coll.

344. Potsdam formation, S. W. ¼ Sec. 23, T. 19, R. 7 W. M. Strong, coll.

345. Potsdam formation, S. W. ¼ Sec. 28, T. 19, R 8 W. M. Strong, coll.

346. Lower Magnesian, N. W. ¼ Sec. 18, T. 13, R. 2 E., F. Freize's Mine. M. Strong, coll.

347. Potsdam formation, S. E. ¼ Sec. 21, T. 25, R. 13 W., Lingula sandstone. M. Strong, coll.

348. Lower Magnesian, Sec. 6, T. 9, R. 4 W., Hall's creek. M. Strong, coll.

351. Galena limestone, N. W. ¼ Sec. 28, T. 1, R. 3 E., Stopline Mine, Brecciated limestone. M. Strong, coll.

352. Potsdam formation, N. W. ¼ Sec. 18, T. 16, R. 2 W., Tunnel No. 3. M. Strong, coll.

353. Potsdam formation, Lone Rock Quarry, Magnesian shale. M. Strong, coll.

353-*a*. Potsdam formation, N. E. ¼ Sec. 24, T. 9, R. 1 E., Siliceous shale. M. Strong, coll.

354. Potsdam formation, N. W. ¼ Sec. 18, T. 8, R. 1 E., Magnesian limestone. M. Strong, coll.

355. Trenton formation, N. E. ¼ Sec. 1, T. 4, R. 2 E., Mineral Point, Blende and Barite. M. Strong, coll.

356. Trenton formation, N. E. ¼ Sec. 36, T. 5, R. 2 E., Mineral Point, Blue limestone. M. Strong, coll.

357. Trenton formation, S. W. ¼ Sec. 8, T. 3, R. 3 E., Calamine, Buff limestone. M. Strong, coll.

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No. 358. Lower Magnesian, N. W. ¼ Sec. 27, T. 10, R. 3 E., Hollow Run, Stalagmite. M. Strong, coll.

359. Lower Magnesian, S. W. ¼ Sec. 28, T. 9, R. 1 E., Orion Lead Quarry, Galenite. M. Strong, coll.

360. Trenton formation, S. W. ¼ Sec. 5, T. 1, R. 2 E., Oakland level, Carbonaceous shale. M. Strong, coll.

361. Galena Limestone, N. W. ¼ Sec. 14, T. 1, R. 2 E., Skullsburg, Dogtooth Spar. M. Strong, coll.

362. Galena Limestone, N. W. ¼ Sec. 6, T. 4, R. 3 E., Mineral Point, Receptaculites. M. Strong, coll.

363. Potsdam formation, Sec. 15, T. 12, R. 3 E., Ironton, Iron Ore. M. Strong, coll.

364. Potsdam formation, N. W. ¼ Sec. 19, T. 12, R. 2 W., Viola, Agnulos convexus, W. M. Strong, coll.

365. Lower Magnesian, S. W. ¼ Sec. 12, T. 5, R. 4 W., Grant Co. M. Strong, coll.

365–*a*. Lower Magnesian, N. W. ¼ Sec. 30, T. 5, R. 4 W. M. Strong, coll.

366. Trenton formation, S. W. ¼ Sec. 10, T. 9, R. 5 W., Seneca conglomerate. M. Strong, coll.

367. Galena Limestone, N. E. ¼ Sec. 6, T. 1, R. 3 E, Mineral Point. M. Strong, coll.

368. Lower Magnesian, N. E. ¼ Sec. 25, R. 3 E. Sauk Co. Drusy quartz. M. Strong, coll.

369. Trenton formation, Galenite from various parts of Grant, Iowa, and Lafayette counties. M. Strong, coll.

369–*a*. Galena Limestone, Galena; from various parts of Grant, Iowa and Lafayette counties. M. Strong, coll.

370. Galena Limestone, Marsden Diggings, Jo Daviess Co., Ill., Pyrite. M. Strong, coll.

371. St. Peters Sandstone, S. W. ¼ Sec. 4, T. 1, R. 6 E., Skinner's creek. M. Strong, coll.

372. Potsdam formation, ¼ post, Secs. 20 and 29, T. 9, R. 3 E., Iron Ore. M. Strong, coll.

373. Lower Magnesian, S. E. ¼ Sec. 22, T. 10 R. 3 E., Sauk Co. Concretions. M. Strong, coll.

374. Potsdam formation, S. E. ¼ Sec. 13, T. 11, R. 4, E. Sauk Co. Hematite. M. Strong, coll.

375. Potsdam formation, S. W. ¼ Sec. 3, T. 14, R. 3 W., Vernon Co. Hematite. M. Strong, coll.

376. Potsdam formation, S. W. ¼ Sec. 7, T. 10, R. 1 E, Richland Co. Hematite. M. Strong, coll.

377. Potsdam formation, center, Sec. 23, T. 10, R. 2 E., Richland Co. M. Strong, coll.

378. Potsdam formation, S. ½ of N. W. ¼ Sec. 18, T. 13, R. 2 E., M. Strong, coll.

379. Potsdam formation, S. E. ¼ Sec. 23, T. 10, R. 3 E., Sauk Co. M. Strong, coll.

380. Potsdam formation, N. W. ¼ Sec. 12, T. 10, R. 1 W., head of Brush creek, Hematite. M. Strong, coll.

381. Potsdam formation, S. W. ¼ Sec. 10, T. 12, R. 5 E., Smith's Mine, Hematite. M. Strong, coll.

382. Potsdam formation, N. E. ¼ Sec. 34, T. 9, R. 2 E., Richland Co., Sandstone. M. Strong, coll.

383. Potsdam formation, S. W. ¼ Sec. 10, T. 12, R. 3 E., Smith's Mine, Ochre. M. Strong, coll.

384. Potsdam formation, S. W. ¼ Sec. 10, T. 12, R. 3 E., Smith's Mine, Silicious Iron Stone. M. Strong, coll.

385. Potsdam formation, center, Sec. 23, T. 10, R. 12 E., Richland Co., Iron Ore. M. Strong, coll.

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No. 386. Potsdam formation, N. E. ¼ Sec. 22, T. 9, R. 2 E., Eaton's farm, Red Clay. M. Strong, coll.
387. Potsdam formation, S. W. ¼ Sec. 20, T. 10, R. 3 E., Sauk Co., Green Clay. M. Strong, coll.
388. Lower Magnesian, between Highland and Centerville, Iowa Co., Galenite. M. Strong, coll.
389. Lower Magnesian, N. E. ¼ Sec. 23, T. 10, R. 3 E., Sauk Co., Iron Stone. M. Strong, coll.
390. Recent, S. W. ¼ Sec. 26, T. 5. R. 1 E., Mifflin, Iowa Co., Travertine (Petrified Moss). M. Strong, coll.
391. Potsdam formation, N. W. ¼ Sec. 10, T. 13, R. 3 E., Sauk Co. Iron Ore, Fe. 59 21-100 per cent. M. Strong, coll.
392. Lower Magnesian, N. W. ¼ Sec. 29, T. 9, R. 1 E., Aikin's Mine Cyrtoceras corniculum. M. Strong, coll.
393. Potsdam formation, N. E. ¼ Sec. 34, T. 9, R. 2 E., Richland Co., Sandstone. M. Strong, coll.
394. Trenton formation, S. E. ¼ Sec. 21, T. 2, R. 1 E., La Fayette Co., Sphalerite. M. Strong, coll.
394–*a*. Trenton formation, S. W. ¼ Sec. 31, T. 5, R 3 E., Mineral Point, Sphalerite. M. Strong, coll.
394–*b*. Trenton formation, S. E. ¼ Sec. 4, T. 1, R. 2 E., Oakland Mine, Sphalerite. M. Strong, coll.
395. Galena Limestone, N. E. ¼ Sec. 8, T. 1, R. 5 E, La Fayette Co., Copper Ore. M. Strong, coll.
396. Lower Magnesian, S. W. ¼ Sec. 26, T. 8, R. 5 W., Plum creek, Copper Ore. M. Strong, coll.
397. Galena Limestone, S. E. ¼ Sec. 32, T. 5, R. 3 E., Mineral Point, Copper Ore. M. Strong, coll.
398. Potsdam formation, S. E. ¼ Sec. 35, T. 9, R. 1 E., Wisconsin R., Copper Ore. M. Strong, coll.
399. Galena Limestone, S. W. ¼ Sec. 22, T. 2, R. 3 E., Lughy farm, Copper Ore. M. Strong, coll.
400. Lower Magnesian, N. E. ¼ Sec. 34, T. 10, R. 5 W., Copper Creek, Copper Ore M. Strong, coll.
401. Galena Limestone, S. W. ¼ Sec. 12, T. 1, R 1 E., Emerson's Quarry, Smithsonite. M. Strong, coll.
402. Trenton formation, N. E. ¼ Sec. 1, T. 4, R. 2 E., Mineral Point, Blende and Pyrite. M. Strong, coll.
403. Trenton formation, N. E. ¼ Sec. 1, T. 4, R. 2 E., Mineral Point, Barite and Blende. M. Strong, coll.
404. Galena Limestone, S. W. ¼ Sec. 6, T. 5, R. 3 E., Van Meter's Survey, Barite. M. Strong, coll.
405. Cincinnati group, Scales Mound Station, Jo Daviess Co., Ill., Limestone. M. Strong, coll.
406. Potsdam formation, S. E. ¼ Sec. 25, T. 12, R. 4 E., Roadside, Scolithus tubes. M. Strong, coll.
407. Trenton formation, S. E. ¼ Sec. 32, T. 5, R. 3 E., Mineral Point, Carbonaceous shale. M. Strong, coll.
408. Trenton formation, N. E. ¼ Sec. 31, T. 2, R 2 E., Silverthorn Mine, Carbonaceous shale. M. Strong, coll.
409. Potsdam formation, N. W. ¼ Sec. 3, T. 12, R. 3 E., Ironton, Arionellus convexus. M. Strong, coll.
410. Lower Magnesian, N. W. ¼ Sec. 22, T. 4, R. 4 W., Grant R., limestone. M. Strong, coll.
411. Potsdam formation, N E. ¼ Sec. 34, T. 9, R. 2 E., Lone Rock Quarry, sandstone M. Strong, coll.
412. Potsdam formation, S. E. ¼ Sec. 3, T. 18, R. 8 W., Gale's Ferry, Lingula sandstone. M. Strong, coll.

Catalogue B.

No. 413. Potsdam formation, N. E. ¼ Sec. 32, T. 9, R. 1 E., L. Hart's well, 50 ft. below the surface, Magnesian limestone. M. Strong, coll.

414. Potsdam formation, S. W. ¼ Sec. 28, T. 19, R. 8 W., Galesville Mill, Argillaceous shale. M. Strong, coll.

414-*a*. Potsdam formation, same locality as above, Micaceous sandstone. M. Strong, coll.

415. Potsdam formation, S. E. ¼ Sec. 3, T. 18, R. 8 W., Gale's Ferry, Micaceous sandstone. M. Strong, coll.

415-*a*. Potsdam formation, same locality as above, Blue shale. M. Strong, coll.

416. Potsdam formation, S. E. ¼ Sec. 31, T. 14, R. 3 W., Bloomingdale, Green sandstone. M. Strong, coll.

417. Potsdam formation, Black River Falls, Jackson county, sandstone, lowest bed. M. Strong, coll.

418. Trenton formation, N. E. ¼ Sec. 3, T. 2, R. 3 E., Darlington Quarry, Stalagmite. M. Strong, coll.

419. Quaternary formation, Monroe, Green county, brick clay. M. Strong, coll.

420. Lower Magnesian, Mill Creek, Green county, Fucoids. M. Strong, coll.

421. Quaternary formation?, 3 miles S. of Reedsburg, Oscar Dix's, Fire Clay. M. Strong, coll.

422. St. Peters Sandstone, S. W. ¼ Sec. 17, T. 2, R. 4 E., Red Rock, Ferruginous sandstone. M. Strong, coll.

423. St. Peters Sandstone, same locality as above, sandstone. M. Strong, coll.

424. Potsdam formation, N. W. ¼ Sec. 33, T. 19, R. 8 W., Galesville, Obolella polita. M. Strong, coll.

424-*a*. Potsdam formation, Black River Falls, Obolella polita. M. Strong, coll.

425. Potsdam formation, 2 miles W. of Black River Falls, Palæacmæa Irvingi. M. Strong, coll.

426. Potsdam formation, N. W ¼ Sec. 16, T. 7, R. 2 E., Otter creek, filling of fractures. M. Strong, coll.

427. Lower Magnesian, S. W. ¼ Sec. 22 T. 12, R. —, Sauk Co., Stalactite (silicious). M. Strong, coll.

428. Potsdam formation, N. E. ¼ Sec. 29, T. 18, R. 7 W., La Crosse Co., Orthis Pepina. M. Strong, coll.

429. Trenton and St. Peters, N. W. ¼ Sec. 15, T. 4, R. 6 W., Glen Haven, Grant Co., Transition bed M. Strong, coll.

430. Potsdam formation, N. E. ¼ Sec. 34, T. 9, R. 2 E., Lone Rock Quarry, Cruziana, sp. undet. M. Strong, coll.

431. Lower Magnesian, N. E. ¼ Sec. 35, T. 11, R. 3 E., Sauk Co., Dusy quartz and Pyrite. M. Strong, coll.

432. Cupriferous, Kettle river, D. A. Caneday's, Taylor's Falls. M. Strong, coll.

433. Potsdam formation, N. E. ¼ Sec. 34, T. 9, R. 7 W., Lone Rock Quarry, Lingulella aurora. M. Strong, coll.

434. Potsdam formation, N. W. ¼ Sec. 16, T. 16, R. 2 W., tunnel No. 3, C. & N. W. R'y, Calcite. M. Strong, coll.

435. Potsdam formation, tunnel No. 3, C. & N. W. R'y, Palæophycus (sp. und.). M. Strong, coll.

436. Potsdam formation, tunnel No. 3, C. & N. W. R'y, Dicellocephalus Minnesotensis. M. Strong, coll.

436-*a*. Potsdam formation, Mazomanie, Dane Co., Trilobite gen. and sp.? M. Strong, coll.

437. Potsdam formation, S. E. ¼ Sec. 31, T. 14, R. 3 W., Bloomingdale, Green sand. M. Strong, coll.

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No. 438. Potsdam formation, N. W. ¼ Sec. 8, T. 14, R. 3 W., P. C. Taylor's farm, Paint clay, washed. M. Strong, coll.
439. Lower Magnesian, S. W. ¼ Sec. 28, T. 9, R. 1 E., Orion Lead Mines, Red clay. M. Strong, coll.
440. Beetown, Grant Co., Hutchinson's Furnace, Slag. M. Strong, coll.
441. Galena Limestone, N. E. ¼ Sec. 26, T. 29, R. 2 E., Scales Mound, Ill., Barite and Brown Spar. M. Strong, coll.
442. Galena Limestone, same locality as above, Barite. M. Strong, coll.
443. Galena Limestone, N. E. ¼ Sec. 15, T. 1, R. 2 E., McNulty's Mine, Chert (decomposed). M. Strong, coll.
444. Galena Limestone, N. E. ¼ Sec. 23, T. 1, R. 2 E., Remick's Quarry, Fucoid. M. Strong, coll.
445. Recent, N. E. ¼ Sec. 6, T. 4, R. 3 E., Mineral Point, Travertine. M. Strong, coll.
446. Archæan? From bottom of artesian well at Tomah, Monroe Co. M. Strong, coll.
447. Lower Magnesian, S. W. ¼ Sec. 9, T. 19, R. 11 W., Fountain City, Calcite. M. Strong, coll.
448. Cincinnati Group, N. E. ¼ Sec. 26, T. 29, R. 2, E., Scales Mound, Ill., Nucula shale. M. Strong, coll.
449. Trenton formation, Sec. 11, T. 4, R. 1 E, Welch settlement, Iowa county, Oxide of Manganese. M. Strong coll.
450. Lower Magnesian, N. W. ¼ Sec. 27, T. 18, R. 9 W., Trempealeau, Hale's Quarry, building stone. M. Strong, coll.
451. Potsdam formation, N. W. ¼ Sec. 9, T. 19, R. 11 W., Fountain City, Concretions. M. Strong, coll.
452. Galena limestone, S. W. ¼ Sec. 31, T. 5, R. 3 E., Mineral Point, Cerussite on Galena. M. Strong, coll.
453. Trenton formation, same locality as above, Calcite and Blende. M. Strong, coll.
454. Potsdam and Cupriferous, N. W. ¼ Sec. 31, T. 34, R. 18 W., St. Croix Falls, junction. M. Strong, coll.
454–*a*. Potsdam formation, same locality as above, sandstone. M. Strong, coll.
455. Potsdam formation, S. E. ¼ Sec. 21, T. 25, R. 3 W., Durand, Fucoids. M. Strong, coll.
456. Potsdam formation, S. E. ¼ Sec. 31, T. 19, R. 10 W., Miss. R. Valley, Lingula and Obolella polita. M. Strong, coll.
457. Potsdam formation, N. W. ¼ Sec. 29. T. 20, R. 10 W., Trempealeau Valley, Obolella polita. M. Strong, coll.
458. Galena limestone, N. E. ¼ Sec. 23, T. 1, R. 2 E., Remick's Quarry, Chætetes lycoperdon. M. Strong, coll.
459. Trenton formation, S. E. ¼ Sec. 8, T. 4, R. 3 E., Mineral Point, Buff limestone, Streptelasma. M. Strong, coll.
460. Trenton formation, S. E. ¼ Sec. 4, T. 1, R. 2 E., Oakland Mine, Palæophycus simplex. M. Strong, coll.
460–*a*. Trenton formation, same locality as above, Palæophycus sp.? M. Strong, coll.
461. Trenton formation, same locality as above, Buthotrephis succulens. M. Strong, coll.
461–*a* Trenton formation, same locality as above, Strophomena alternata. M. Strong, coll.
462. Trenton formation, same locality as above, Concretions. M. Strong, coll.
463. Trenton formation, same locality as above, Shell rock, Blue limestone. M. Strong, coll.
464. Trenton formation, same locality as above, Stictopora. M. Strong, coll.

Catalogue B.

No. 465. Trenton formation. S. W. ¼ Sec. 17, T. 26, R. 17 W., Ellsworth, Chætetes. M. Strong, coll.
465–*a*. Trenton formation, same locality as above, Chætetes lycoperdon. M. Strong, coll.
466. Trenton formation, S. E. ¼ Sec. 4, T. 1, R. 2 E., Oakland Mine, Monticulipora. M. Strong, coll.
467. Trenton formation, same locality as above, Pygidium of trilobite. M. Strong, coll.
468. Trenton formation, same locality as above, Trilobite. M. Strong, coll.
469. Trenton formation, same locality as above, Asaphus sp.? M. Strong, coll.
470. Trenton formation, same locality as above, Schizocrinus nodosus. M. Strong, coll.
471. Trenton formation, S. W. ¼ Sec. 17, T. 5, R. 5 W., bed of stream, Dalmania meta. M. Strong, coll.
471–*a*. Trenton formation, same locality as above, Tellinonya alta. M. Strong, coll.
472. Trenton formation, N. E. ¼ Sec. 6, T. 4, R. 3 E., Mineral Point, Illænus ovatus. M. Strong, coll.
472–*a*. Trenton formation, same locality as above, Asaphus. M. Strong, coll.
474. Trenton formation, same locality as above, Bathyurus, n. sp. M. Strong, coll
475. Galena Limestone, S. E. ¼ Sec. 10, T. 1, R. 2 E., Shullsburg, Asaphus gigas. M. Strong, coll.
475–*a*. Trenton formation, N. E. ¼ Sec. 6, T. 4, R. 3 E., Mineral Point, Asaphus gigas. M. Strong, coll.
475–*b*. Trenton formation, Sec. 15, T. 4, R. 2 E., Roadside, Asaphus gigas. M. Strong, coll.
476. Trenton formation, S. E. ¼ Sec. 4, T. 1, R. 2 E., Oakland Mine, Blue limestone, Leptæna sericea. M. Strong, coll.
477. Trenton formation, same locality as above, Leptæna sericea. M. Strong, coll.
478. Trenton formation, same locality as above, Crania, n. sp. M. Strong, coll.
479. Trenton formation, S. E. ¼ Sec. 31, T. 5, R. 3 E., Mineral Point, Rhynchonella Anticostensis? M. Strong, coll.
480. Galena Limestone, N. E. ¼ Sec. 23, T. 1, R. 2 E., Remick's Quarry, Orthis lynx. M. Strong, coll.
482. Cincinnati Group, S. W. ¼ Sec. 22, T. 1, R. 2 E., E. Platte Mound, Orthis tricenaria. M. Strong, coll.
483. Trenton formation, N. E. ¼ Sec. 21, T. 3, R. 4 W., Grant R., Strophomena alternata. M. Strong, coll.

ARCHÆAN SPECIMENS.

501. Sec. 36, T. 35, R. 21. T. C. C., coll.
502. Menomonee river, Sec. 35, T. 35, R. 21. T. C. C., coll.
503. Syenite, E. ½ of S. W. ¼ Sec. 21, T. 33, R. 20. T. C. C., coll.
504. Sec. 11, T. 32, R. 18, Oconto Co. T. C. C., coll.
506. Syenite, etc., T. 31, R. 17, Oconto Co. T. C. C., coll.
507. Coarse Granite, Menomonee Reservation, 6 miles S. of Keshena. T. C. C., coll.
508. Granite, Keshena Mills, Menomonee Reservation. T. C. C., coll.
509. Coarse Granite, Smoky Falls, Menomonee Reservation. T. C. C., coll.
510. Granite, Dalles, Wolf river, Menomonee Reservation. T. C. C., coll.

Catalogue B.

No. 511. Granite, etc., Big Falls of Peshtigo river. T. C. C., coll.
512. Quartzite, etc., Pemena Falls. T. C. C., coll.
513. Near Knowlton, Marathon Co., middle of Sec. 29, T. 26, R. 7 E. T. C. C., coll.
514. Granite Mukwa, T. 22, R. 14, N. W. ¼ of S. W. ¼ Sec. 25. T. C. C., coll.
514-*a*. Granite, Mukwa, S. E. ¼ of N. E. ¼ Sec. 26. T. C. C., coll.
515. Granite, etc., Waupaca. ———, coll.
516. Coarse Granite, S. E. ¼ of S. E. ¼ Sec. 32, T. 23, R 12, 5 miles N. of Waupaca. T. C. C., coll.
517. Porphyry, Berlin, T. 17, R. 13 E. T. C. C., coll.
518. Quartz Porphyry, Pine Bluff, T. 15, R. 13 E. T. C. C., coll.
519. Quartz Porphyry, Marquette, T. 15 R. 11 E. T. C. C., coll.
520. Quartzite, Lower Narrows, Sauk Co., T. 12, R. 7 E. T. C. C., coll.
521. Quartzite, Upper Narrows, Sauk Co., T. 12, R. 5 E. T. C. C., coll.
521-*a*. Banded Quartzite, same locality as above.
521-*b*. Pinkish Quartzite, same locality as above.
521-*c*. Gray Quartzite, same locality as above
521-*d*. Schistose Quartzite, same locality as above.
521-*e*. Potsdam Sandstone Quartzite and friable layers?, same locality as above.
521-*h*. Conglomerate, same locality as above.
522. Quartzite, Portland, Sec. 35, T. 9, R. 13 E. T. C. C., coll.
523. Quartzite, Waterloo, Sec. 25, T. 8, R. 13 E.
534. Talcose schist, Junction City, Portage Co., N. W. ¼ Sec. 2, T. 24, R. 6 E. T. C. C., coll.
535. Watsewince Mt. T. C. C., coll.
536. From near Peshtigo. T. C. C., coll.
537. With Green Lake and Ripon specimens. T. C. C., coll.
538. Drift specimens, Milwaukee. ———, donor.
539. Drift specimens, Burlington. T. C. C., coll.
540. Metamorphic conglomerate, Sec. 2, T. 29, R. 7 E., S. side of Wis. R. near Wausau. T. C. C., coll.
540-*a*. Quartzite and Gneiss, Sec. 29, T. 29, R. 7 E. T. C. C., coll.

ORES AND MINERALS.

541. Drift copper from various localities. ———, donors.
542. Iron Ore, top layers, Mayville bed, Hematite. T. C. C., coll.
543. Iron Ore, Oolitic layers, Mayville bed, Hematite. T. C. C., coll.
544. Iron Ore, bottom layers, Mayville bed, Hematite. T. C. C., coll.
545. Iron ore, Shatt Mine, Iron Ridge, Hematite. T. C. C., coll.
546. Iron Ore, Hartford, Main St., Freeman's cellar, Hematite. T. C. C., coll.
547. Iron Ore, Stockbridge, N. E. ¼ Sec. 26, T. 19, R. 18 E., Hematite. T. C. C., coll.
548. Bog Iron Ore, Oak Creek, S. W. ¼, Sec. 1, T. 5, R. 22, Limonite. T. C. C., coll.
549. Drift Ore, Lagrange, N. E. ¼ Sec. 9, T. 4, R. 16, Hematite. T. C. C., coll.
550. Iron Ore, Lake Superior, Jackson Mine, Magnetite and Hematite. T. C. C., coll.
551. Iron Ore, Lake Superior, Republic Mine, Magnetite. T. C. C., coll.
552. Iron Ore, Drift, locality unknown. ———, coll.
553. Slag from blast furnace, Iron Ridge.

Catalogue B.

No. 553. Black slag, No. 553–*a*, Royal purple slag; No. 553–*b*, Violet blue slag; No. 553–*c*, Greenish blue slag; No. 553–*d*, Greenish citron slag; No. 553–*e*, slag foam. T. C. C., coll.

554. Pyrites, Racine limestone, Root R. Rapids, Racine. I. A. Lapham, coll.

554–*a*. Pyrites, Cincinnati, Scales Mound, Ill. ———, coll.

555. Marcasite, Galena, New Diggings, N. E. ¼ Sec. 26, T. 1, R. 1 E. I. A. Lapham, coll.

556. Barite, Galena, Scales Mound, Ill. ———, coll.

557. Galenite, Galena, Mineral Point, etc. ———, coll.

558. Smithsonite, Galena, Mineral Point. ———, coll.

559. Sphalerite, Galena, Shullsburg. ———, coll.

560. Oxide of Manganese, Trenton, Sec. 11, T. 4, R. 1 E. M. Strong, coll.

DESCRIPTIONS OF NEW SPECIES OF FOSSILS FROM THE PALEOZOIC FORMATIONS OF WISCONSIN.

BY R. P. WHITFIELD.

HOLOPEA SWEETI; n. sp.

Shell of moderate size, the largest specimen observed having a length of one inch and an eighth, and a transverse diameter of the outer volution, of seven-eighths of an inch. Volutions four in number, rapidly increasing in size, very ventricose and rounded, with deeply marked sutures; which present the appearance of having been channeled in the perfect condition. Body volution forming nearly one-half the length of the shell; aperture large, broadly subovate or semilunate, widest below the middle; the columellar lip being straight and vertical in the upper part, but rounded into the basal margin below. Apical angle sixty-five to seventy degrees. Surface smooth and the substance of the shell thin.

The examples are all internal casts and impressions, preserved in a very friable brown sandstone; but are perfectly free from compression, and show the shell to have been very thin, and the axis minutely perforate. The species differs from that described by Prof. A. Winchell as *Pleurotomaria ? advena* (Am. Jour. Sci. and Arts, Vol. XXXVII, March, 1864, p. 228) in having strongly convex instead of depressed convex whorls; in its more rapidly increasing volutions, and in not having three of "nearly equal height." It will also be noticed how nearly it resembles *Scævogyra elevata*, described by me from the Lower Magnesian limestone; but they differ very materially in the size and form of

the umbilical opening, which in that species has been rather large and open; while in this one it is only minutely perforate in the cast, and may possibly in the perfect state have been entirely solid.

Formation and locality. In the Potsdam sandstone at Osceola Mills, Wis., named in honor of Mr. E. T. Sweet.

SCOLITHUS ? WOODI; n. sp.

Certain layers of the sandstone of the Potsdam formation in the Devil's Lake region, and near Baraboo, are abundantly marked by numbers of vertical and usually cylindrical perforations, of about a line or little more than a line in diameter, and varying in length from one to several inches. These perforations, when seen in vertical sections of the rock, are straight or variously bent, and although often seen interfering with each other in their course, do not bifurcate or branch. The walls of the tubes are usually smooth, but occasionally one may be seen presenting a corrugated appearance, as if from irregular annulations. In examining the layers of sandstone, the perforations are commonly seen penetrating a certain layer in great numbers, up to a certain elevation, at which point they all become interrupted; and the next layer above apparently destitute of any such feature. In selecting examples for cabinet specimens from among those near Devil's Lake, this feature was particularly noticeable.

These vertical perforations have been generally referred to *Scolithus linearis*, Hall (Pal. N. Y., vol. I, p. 2, Pl. I, fig. 1), which is a common fossil in the Potsdam sandstone in Vermont, Massachusetts and Pennsylvania; but these western forms differ from that one in several particulars. The *S. linearis* is said to be from an eighth of an inch to half an inch in thickness, and often occurs of several feet in length, and is generally rigidly vertical and parallel; while the surface is said to be sometimes striated. These western specimens are seldom seen to occur of even an eighth of an inch in diameter, and are generally less than one-tenth; they are, although normally vertical, nevertheless com-

monly deflected at various angles near the surface of the layers, and not unfrequently run quite obliquely for considerable distance through the rock; and along the natural surface of a layer are often horizontal for a short distance, or open obliquely on such surface.

There has long been much doubt as to the true nature of *Scolithus.* The genus was at first supposed, by its author, to be of vegetable origin, and such appears to have been the impression entertained by Prof. Hall, when describing them in the Pal. of N. Y., as above cited. The specimens used in that description would also naturally lead one to such a conclusion, as their resemblance is much greater to plant forms than to the borings of annelids, especially if the assertion that they are occasionally found several of feet in length is correct, and not a misapprehension; while these western forms are as distinctly the work of worm-like animals as are those on any of our modern sea beaches. Among the specimens from Wisconsin are some from Baraboo, collected by Mr. J. W. Wood, of that place, and for whom we have named the species, that clearly demonstrate this fact.

The specimens above referred to, preserve on the blocks the natural surface of the layer, over which and in which the worms have crawled and burrowed; and on one large block the little hillocks, thrown up and formed about the opening of their burrows, are as perfectly preserved as if they had been recently made. In many cases the perforation is still to be seen, rising through the elevation, with its margins excavated into a funnel shaped depression, as if by the circular or wave-like motions of the animal while extended beyond the opening. Other blocks, which have been worn away or split horizontally just below the natural surface, show the tubes which have been excavated so near to others, previously filled, as to cut out a part of the same area, so as to form a series of semilunate perforations, on the removal of the fillings by decomposition.

I have felt considerable hesitation as to the propriety of placing these forms under the genus *Scolithus;* feeling a doubt of the ani-

mal nature of the forms originally referred to that genus. But not having access to Prof. Haldeman's original description, I have concluded to leave them thus classed for the present.

Among the specimens collected and sent by Mr. Wood, is one of peculiar form which he had supposed to be due to the decomposition of some vegetable substance. It is an impression in the sandstone formed by the removal of a root-like body, from four to five inches across, and elevated in the middle about one and a half inches; composed of a central prominence dividing up into numerous rootlets of varying thickness, from an eighth to more than one-fourth of an inch, and quite tortuous and rugose in character. The form of the object would indicate a plant of upright growth and of an order somewhat higher or more advanced than either *Palæophycus* or *Lycrophycus*. The specimen is quite distinct and well marked, but of obscure nature, so it has not been thought necessary to incur the expense of figuring.

CONOCEPHALITES ? QUADRATUS; n. sp.

Entire form of body unknown, the species being founded upon detached portions of the head only.

Glabella and fixed cheeks when united, minute, quadrangular in outline, the glabella forming but a small portion of the whole. The form of this latter part is quadrangular or very slightly tapering upward, and squarely truncate at the summit, the length being about once and a half as great as the greatest width, which is across the base. The surface is highly convex and destitute of glabella furrows, its margin abruptly limited by very deep and narrow dorsal furrows, which are continued in equal depth in front. Fixed cheeks, large and gently convex, their width being nearly once and a half that of the glabella, and their surface even with that of the posterior half of the frontal limb immediately in front of the glabella, marked on their margins by semicircular ocular sinuses of medium size. Anterior half of the frontal limb depressed, with the outer margin recurving, forming a broad, concave channel on the anterior half of this portion of the plate.

Occipital ring very narrow, prominent and rounded, the groove narrow and deep, being a continuation of, and of a similar character with, the dorsal furrows bounding the glabella. The occipital furrow is entirely obsolete on the glabella, the posterior portion of this member being continued backward in a long curved spine, having a length equal to that of the glabella itself.

Movable cheeks short, but much extended laterally, the entire lateral length of each being nearly twice as great at the longitudinal diameter of the cheek along the line of the facial suture. Form of the cheek short-falcate, the posterior angle being curved slightly backward from a point opposite the eye lobe; anterior margin curved, with a constantly increasing curvature, from the anterior angle to the posterior projection. Surface of the cheek gently convex, the outer border much thickened on the under side, leaving a wide, deep groove on the cast, as seen in the rock.

There are remains of thoracic segments and minute pygidia associated in the rock with the parts described, but owing to their minute size, and the fact that they are associated with at least three other species of trilobites, I have deemed it most prudent to leave them uncharacterized.

The species is of minute size, and is peculiar for the quadrangular glabella, deep dorsal furrows, wide fixed cheek, and the quadrangular form of the central parts of the head when together. The head shield, when provided with the movable cheeks in place, would be several times as wide as long, and this feature alone would serve as a guide in identification, should it be found in a more entire condition than the specimens under consideration.

Formation and locality. In yellow sandstone of the Potsdam group, at Eau Claire, and at Ettrick, Wisconsin.

CONOCEPHALITES (PTYCHASPIS?) EXPLANATUS; n. sp.

Species known only by the glabella and fixed cheeks, and these in a somewhat fragmentary condition. The form of these parts, as seen united, is somewhat quadrangular, rather longer than wide, and with rather prominent surface features. The glabella is

elongate-quadrangular, narrowest across the anterior third of its length, rounded anteriorly and widening posteriorly to the back of the occipital ring; its length, when measured from the occipital furrow, is equal to once and a half the smallest tranverse diameter; surface moderately convex and marked by three pairs of transverse furrows, the middle one of which is a little anterior to the middle of the length, deeply marked near the outer ends, and barely perceptible on the inner third of the length, their direction being slightly backwards toward the center. The posterior pair is very oblique, equally well marked, but narrower, and extends entirely across the glabella, but only faintly marked in the center. The anterior pair is short, more faintly marked, and situated about one-fourth of the width of the glabella from the anterior end. Fixed cheeks and frontal limb proportionally wide, the anterior half of the latter bent upward, forming considerable of an angle with the flattened portion around the glabella. Palpebral lobes proportionally large and moderately prominent; ocular ridges very distinctly marked, and very oblique, arising from the posterior part of the anterior glabellar lobe, and passing to the anterior extremity of the eye lobe. Occipital ring flattened or very depressed convex on the surface, narrower than the glabellar lobes, and the furrows shallow and only moderately well marked. Facial suture passing from the eye with a strong outward curvature to the anterior border, which it reaches nearly on a line with the eye; its course behind the eye not determined. Surface apparently smooth.

In the form of the glabella, this species presents features corresponding to those of the genus *Ptychaspis*, Hall, but differs in the direction of the facial suture, and in the form and character of the eyes. It also somewhat resembles some specimens of *Conocephalites diadematus*, H., but differs in wanting the thickened anterior border of the head of that species, and in the great width of the fixed cheeks. Except for this latter feature, it would correspond very closely with *Dicellocephalus pepinensis* as seen in the central part of Fig. 14, Plate X, of the 16th Rept. State Cab. N.

Y.; but not with any other specimen of that species among a large number in that same collection. The one referred to is the only one showing the constriction in the width of the glabella, and we are strongly inclined to think it a different species from *D. pepinensis*, Owen.

Formation and locality. In brown friable sandstone of the Potsdam period, at Hudson, Wisconsin.

CREPICEPHALUS? GIBBSI; n. sp.

Conocephalites Gibbsi — Whitfield; Wis. Geol. Rept., Vol. II, 1873–1877, p. 67.

Species recognized only in movable cheeks and pygidia which occur in great numbers in a coarse brown sandstone as casts left by the removal of the substance of the fossils.

The movable cheeks are of moderate size, elongate triangular in form, depressed convex on the surface and rather oblique. Margin of the plate bordered by a rather wide, rounded, thickened rim, which increases in width posteriorly, and terminates in a thickened, slightly compressed spine of a length about equal to that of the cheek from the anterior margin to the origin of the spine. Inner area of the cheek distinctly convex and separated from the margin by a well defined sinus, and from the occipital ring by a deeper furrow. Ocular sinus rather small and surrounded by a slightly depressed furrow.

Pygidium proportionally large, transversely elliptical in form with subacute lateral extremities; posterior margin almost regularly rounded, and nearly twice as abruptly curved as the anterior border; plate strongly trilobed, the axial lobe forming considerably more than one-third of the entire width of the plate, somewhat strongly convex, and terminating a little within the posterior margin in a broad, obtusely rounded extremity, and marked by four strongly elevated rings exclusive of the terminal lobe. Lateral lobes marked by only three visible ribs, which are faintly developed.

In the general form of the cheek this species most nearly re-

sembles *C.* (*Loganellus*) *centralis* Whitf., from the Potsdam sandstone of the Black Hills of Dakota (see Prelim. Rept. on the Pal. Black Hills, 1877, p. 10, and Pl. II, final Rept., fig. 24); it is, however, very much wider from the ocular sinus to the thickened margin, and also more oblique. It also resembles that of *C.* (*Loganellus*) *simulator* H. and W., Pal. Rept. 40th Parallel Surv., p. 218, Pl. II, figs. 16–18; but differs in the less curved or arcuate outer border; more distinctly rounded and wider marginal rim; smaller ocular sinus, and in the well marked groove surrounding the eye. The pygidium differs from any known form in the great proportional width of the axial lobe.

Formation and locality. In coarse brown and friable sandstone of the Potsdam group at Berlin, Green Lake county, Wisconsin.

PTYCHASPIS STRIATA; n. sp.

Ptychaspis granulosa — Hall; 16th Rept. State Cab. N. Y., p. 173. Pl. VI, figs. 33–40. *Not Dikellocephalus granulosus — Owen.*

Differs from *Ptychaspis granulosa* Owen sp. in having the surface of the head strongly striated or marked with elevated ridges, which are more or less parallel to the margin.

DICELLOCEPHALUS LODENSIS; n. sp.

Several specimens of a pustulose cheek of a species of *Dicellocephalus* have been obtained from the Mendota beds at Lodi, by Mr. H. W. Eaton, which entirely differs from any hitherto noticed species; and which, from its marked peculiarity, will be readily recognized, should it be obtained at other localities. The form is much like those associated with, and usually referred to, *D. Pepinensis* Owen, from the same horizon, but differs in its narrower border, shorter spine, somewhat larger ocular sinus, but most noticeably in the surface structure, which is strongly pustulose over the entire area within the thickened marginal rim, the pustules being the largest and most regularly arranged near the ocular sinus, and decreasing in size toward the outer edge of the

cheek. The occipital furrow across the cheek has been strong and deep.

The species resembles in its surface features the cheek of *Ptychaspis granulosus*, Owen's sp., but differs in its more erect form, much larger ocular sinus, narrower, thickened margin, and more slender posterior spine, and may be readily distinguished by these features. No other parts of the organism have yet been discovered, but from the occurrence of several movable cheeks among the collections obtained during a single short visit to the locality, there can be no doubt that the species will prove an abundant one in further collections, and from its peculiar features will be readily identified.

AGLASPIS EATONI; n. sp.

Body small and longitudinally oval in form, the length being equal to once and a half the width, which is at nearly the middle of the length. Surface moderately convex and distinctly longitudinally trilobed. Cephalic shield semicircular, about half as long as wide, rounded on the margin, and possibly slightly emarginate or notched in the middle of the anterior border, having the genal angles slightly produced, forming obtuse points. Surface of the plate trilobed, the central portion (glabella?) narrow, nearly two-thirds as long as the plate, conical in form, and obscurely marked by transverse furrows. Occipital furrow distinct, both on the central lobe and across the base of the cheek or lateral portion, to near the margin, where it passes into an obscure submarginal furrow, leaving the central portions of the cheek prominently convex. Eyes prominent, elongate elliptical in form, situated within the anterior half of the length of the shield, and at a distance equal to about their own length from each other, their anterior ends directed slightly inward, giving them an oblique direction to the axis.

Thorax distinctly but not prominently trilobed, but with obscure dorsal furrows, and consisting of eight segments or articulations. Axial lobe fully one-third of the entire width, the greatest

width being at the third segment; the form is slightly narrowed anteriorly, and gradually contracting behind to the pygidial plate. Segments arching forward on the axial lobe and distinctly backward in their course across the lateral lobes, the deflection increasing posteriorly to the last one, which is abruptly arched or bent. General surface of the segments flattened, with the middle slightly depressed, forming a broad furrow, which extends nearly to the extremity and embraces almost the entire width of the segment, leaving the anterior margin sharply raised, and the posterior border rounded. Extremities of the free pleura wider than their inner ends, rounded on the front side, and slighly mucronate on the posterior edge, the extremity being directed slightly backward. The rounded posterior margin of the thoracic segments and the occipital margin of the cephalic shield are marked by a series of minute pointed nodes, numbering from eight to ten on the axial lobe, and about an equal number on each of the lateral portions of the principal segment.

Pygidial plate small, apparently triangular, and terminating in a slender triangular spine, of a length more than equaling half that of the thorax, and is apparently grooved on its under surface. Surface of the crust of the body minutely granulose.

This species differs from *A. Barrandi* Hall, as represented by the original specimens, in its minute size; that one attaining a transverse diameter of two and three-fourths inches across the base of the head, while this one is scarcely more than half an inch. It also differs in the greater proportional length of the cephalic shield, and the more distinct glabella-like central portion, and more distant eye-tubercles. The thoracic segments differ in being distinctly furrowed or channeled, and in the presence of the lines of nodes along their posterior borders, and on that of the cephalic shield; which feature would naturally be one of adult age, rather than of a young stage of growth. With the other parts of the body of *A. Barrandi*, there is yet no means of comparing it, other than that furnished by the few fragments of that species originally figured, loc. cit.; but there is evidence in one of them, that

at least some of the thoracic segments were continued at their extremities into long, recurving points (see 16th Rept. N. Y. Cab., Pl. II, fig. 14), which is not the case in this species. It might possibly be considered as the young of that species, were it not for its perfection of features, and the evidence of adult characters in its ornamentation, which, with the difference in structure and the proportion of parts, would tend to show its specific difference. This species would seem to be somewhat more closely related to the true trilobites than *A. Barrandi* was at first supposed to be, judging from remarks made by the author of the genus. The distinctly trilobed character of the thorax, and the glabella-like central lobe of the head, with its transverse furrows, are strong trilobitic characters. No evidence, however, of facial sutures can be detected on the superior surface of the head, nor any lobation of the pygidial plate.

Formation and locality. In the upper part of the Potsdam group (Mendota beds) at Lodi, Wisconsin. The species is named in honor of its discoverer, Mr. Harlow W. Eaton, late of Lodi, Wis.

METOPTOMA RETRORSA; n. sp.

Shell above a medium size, and highly elevated, the basal margin or aperture is very broadly ovate in outline, being longer than wide, the relative diameters are as eleven to thirteen, and the greatest transverse diameter at about one-third of the length from the anterior margin. Apex highly elevated and somewhat attenuate above, projecting beyond or overhanging the anterior margin of the aperture, and the upper part laterally compressed and reflexed or curved backwards, as in the Cretaceous genus *Anisomyon* Meek. Anterior slope of the shell concave below the reflexed portion, lateral slopes slightly convex, and the posterior slope more strongly convex, the back in the upper half of the length obtusely angular. Surface marked only by concentric lines of growth.

The specimen is mostly an internal cast, and there are some indications of muscular impressions on the left side figured, which

unfortunately were not observed until the figures were in the hands of the lithographer; they are, however, too indistinct for positive determination. There is one elongated or elliptical area of considerable size, apparent about the middle of the length on the left side, and a line of small isolated areas extend from this one around and across the posterior slope of the shell. Similar indications are also seen in front of the apex, on the anterior slope. Along the right side of the shell no traces of scars are observable, and it is probable they were interrupted at this point, as in many genera of this group of shells.

It is somewhat remarkable, and also interesting, to find a group of shells at this low geological horizon, so closely resembling forms pertaining to the Cretaceous rocks, these reflexed forms differing in general appearance and structure, so far as determined from *Anisomyon*, only in wanting the few radiating grooves characterizing most of the species of that genus.

TROCHONEMA BEACHI; n. sp.

Shell of medium size, broadly conical, with a low, conical spire consisting of about three volutions, which increase very rapidly in size with subsequent age, and are closely coiled, the entire height of the shell being rather less than the transverse diameter. Volutions having a general quadrangular aspect in a transverse section, with truncated corners, the top, the dorsal and lower sides representing the sides of the quadrangle; periphery vertical, forming a broad, flattened, vertical band; top of the volution also flattened, and the space between slightly concave; under surface gently rounded, and representing a depth rather less than that of the vertical band; inner volutions projecting above the outer ones equal to about two-thirds of their entire depth, or to the base of the vertical portion. Aperture subquadrangular, the margin somewhat expanded in adult shells, especially on the lower side. Umbilicus small and abrupt. Surface, as shown by the matrix, marked by transverse striæ of growth, which have a general backward direction in passing from the upper to the under surface of the volution.

The shell has the general aspect of *T. umbilicata* Hall, but is rather smaller, and is more compactly coiled, with a proportionally higher spire, very much more rapidly increasing volutions, which are more decidedly quadrangular, less spreading and of greater proportional height. These features combine to give the shell a very much smaller umbilical opening. We were at first inclined to refer this species to Hall's *Pleurotomaria ambigua*, Pal. N. Y., Vol. I, p. 176, Pl. XXXVIII, fig. 3, but on examining the type specimen it proves to be quite distinct, as that shell has no flattening on the upper surface of the volution, but is distinctly convex from the margin of the vertical band on the periphery to the base of the preceding volution, and is also destitute of an umbilical opening; the columella is straight, and slightly prolonged at the base. On the specimen we can detect no evidence whatever of the vertical striæ shown in the figure.

Formation and locality. In the Buff beds of the lower part of the Trenton group, below Carpenter's quarry, near Beloit, and at the railroad quarries three miles above Beloit; also at Janesville and other places in southern Wisconsin.

ENDOCERAS (*Cameroceras*) SUBANNULATUM; n. sp.

Shell of moderate or large size, and moderately expanding from the apex to the outer chamber, the rate of increase being about three-eighths of an inch in a length of four inches, or less than one-eighth of the increase in length in a slightly compressed specimen. Section oval, the relative diameters being as three to four. Surface of the shell marked by closely arranged concentric undulations, which encircle the tube and are arched upward in crossing the narrower sides of the shell. The undulations form low, rounded ridges, with concave interspaces, and count about six in the length of one inch. There are also indications of finer lines of growth, of which four or five occur on each annulation. Septa deeply concave, arching upward on the sides of the shell, corresponding in this feature, and also in their distance from each other, to the undulations of the surface. Inner tube (or siphuncle) pro-

portionately large, fully equaling one-half the shorter diameter of the outer tube, situated on one of the flattened sides of the shell, and almost in contact with the outer tube; its surface straight, or destitute of any expansion between the septa, but marked by oblique lines or slight ridges where the septa have been broken from around it, their obliquity corresponding to the concavity of the septa.

This species somewhat resembles *Endoceras annulatum*, Hall (Pal. N. Y., Vol. I, p. 207; Pl. 44, fig. 1); but differs in the strength of the annulations, which are only about half as large, and in a corresponding difference in the distance of the septa. The transverse section of that species is round, while this is oval; and this latter feature in our species is a natural one, as is very distinctly shown by the arching upward of the septa on the sides of the shell, which, if the form was due to compression, would not occur.

Formation and locality. In the upper part of the buff limestone of the Trenton group, at Hess' quarry, near Beloit, Wisconsin.

CYRTOCERAS PLANIDORSATUM; n. sp.

Among the collections made from the lower buff or bluish-buff limestones near Beloit, there exist several specimens of a *Cyrtoceras*, presenting features so unlike any previously described species that it is readily distinguished, and as it has been noticed as yet only in the lower beds, it may prove a characteristic species of that horizon. The form is but slightly curving, the degree of arcuation being not more than one-sixteenth of the length; or, the curvature being one-sixteenth of an inch in a length of one inch. The tube is but slightly expanding, and is unequal sided; the dorsal side being very depressed convex to near the edges, then more abruptly curving, while the ventral or inner side of the tube is very convex, forming a segment of a broadly oval figure, the transverse section appearing as an oval with one side pressed nearly flat, the short diameter being a little more than two-thirds as great as the larger. Among the specimens noticed, there are

but few septa preserved, the lower portion being represented only by the cavity in the rock; where any are preserved, they are closely arranged, moderately concave, and very regular in their distance. Siphuncle minute, nearly marginal at the middle of the flattened side. Surface marked only by concentric striæ of growth, which indicate a broad, shallow sinus in the outer margin, on the flattened side of the shell.

The unequal sided form, nearly straight tube with slightly increasing diameter, are distinguishing characteristics.

Formation and locality. In the lower part of the buff limestones of the Trenton group, below Carpenter's quarry, and at the railroad quarries, three miles above Beloit, Wisconsin.

ONCOCERAS MUMIAFORME; n. sp.

Shell of small size, the largest individual observed scarcely exceeding half an inch in its greatest diameter, and with a length of probably two inches. Form gradually expanding from the apex to the base of the outer chamber, above which it rapidly contracts, until within a distance of the last septum, much less than its diameter, it is only about two-thirds of the greatest diameter, and is then again expanded to the aperture. Shell slightly curving throughout, appearing more strongly arched on the outside near the upper part, or just below the constriction of the outer chamber, owing to the contraction being more on the outer surface than on the inner side. Transverse section nearly circular, the inner side being just perceptibly less convex than the outer surface. Septa shallow or but slightly concave, arching upward on the inner side, and broadly sinuate on the back; distantly arranged in the lower part of the tube, becoming more crowded in the upper portion, at least for the three or four upper chambers. In the lower part of the tube, four chambers occupy a space equal to the diameter of the upper portion of the outer one measured. Siphuncle central, minute. Surface smooth, so far as can be determined by the specimens, which are all internal casts or impressions of the exterior.

The species has somewhat the character of *O. constrictum* Hall, from the Trenton limestones of New York; but is much less rapidly expanding, proportionally more slender, and much less strongly arcuate.

Formation and locality. In the Lower Buff limestone of the Trenton group, below Carpenter's quarry, near Beloit, Wisconsin.

ONCOCERAS BREVICURVATUM; n. sp.

Shell of rather small size, very sharply curved throughout its length, and very abruptly expanding from the apex to the aperture; the rate of increase being about as one to four, as compared with the length; the diameter doubling in a length equal to four times the diameter of the part measured, the length measured on the outer curve. Transverse section nearly circular, the dorso-ventral diameter only perceptibly smaller than the lateral diameter, and the ventral surface a little more flattened than the dorsum; the latter being very slightly angular. Septa moderately concave, not arching upward on the back; about six chambers occupying a length equal to the diameter of the outer one of those counted. Siphuncle small, situated just within the dorsal surface. Surface smooth.

This species in many respects resembles *Oncoceras abruptum* Hall, Rept. Prog. Geol. Surv. Wis., 1861, p. 44 (= ? *O. pandion*), but differs in the abruptly curved form, and in the nearly circular section of the shell; the variation of diameters, although very slight, being in the opposite direction to what it is in that species. The specimens show no evidence of contraction of the outer chamber near the aperture, but may possibly be immature.

Formation and locality. In the upper part of the buff limestones of the Trenton group, at Hess' quarry, near Beloit, Wisconsin.

ASAPHUS TRIANGULATUS; n. sp.

Species known only by the pygidium, which is almost equilaterally triangular in outline, the breadth across the anterior margin exceeding, by a very little, the length of the side from

the antero-lateral angle to the posterior extremity; anterior margin arcuate; posterior extremity obtusely pointed, and the lateral margins nearly straight or a little rounded in the upper part; surface of the plate moderately convex, the lateral lobes rather flattened on the inner half, outside of which they slope rapidly and are again recurved near the outer border, leaving a concavity just within the margin; axial lobe very depressed convex, two-thirds the length of the plate, and comparatively narrow; wide on the anterior margin, but rapidly contracting to the middle of its length, and less rapidly behind; the extremity obtusely rounded; anterior extremity marked by a scarcely preceptible ring, beyond which it is smooth; lateral lobes marked only by a single broad, distinct and deep furrow near the front margin, on the inner part; but which becomes obsolete before reaching the margin; articular slopes of the antero-lateral angles wide and very oblique, truncating the outer angles.

The species is peculiar for its triangular caudal shield; differing in this respect from any heretofore described species.

Formation and locality. In the blue limestone of the Trenton group, in the bed of the creek on Sec. 5, T. 5, R. 5 W., Grant county, Wisconsin.

FISTULIPORA RUGOSA; n. sp.

Bryozoum forming solid, cylindrical, bifurcating branches; the bifurcations widely divergent, and the stems often slightly flattened at these points; general surface of the stems marked by distant, but rather indistinct pustules, which in some cases are grouped together, so as to form annulating ridges surrounding the stems; the stems are densely covered by minute rounded pores with comparatively narrow interspaces; and these latter spaces are occupied by variously formed pits of small size, generally not exceeding one between any two cells, except at the angles between three adjoining cells, where they are frequently grouped into three or more to each group.

The principal point of difference between this and other forms

of the genus is, in the general surface features of the stems or branches being pustulose or annulated.

Formation and locality. In the shales of the Hudson river group, at Delafield, Wisconsin.

STREPTORHYNCHUS CARDINALE; n. sp.

Shell small, transversely subelliptical in outline, and plano-convex in profile; the length from beak to base, measured on the ventral valve, about two-thirds, or a little more than two-thirds the width. Ventral valve flattened or very depressed convex, with a broad cardinal area, which, on a specimen measuring about seven-eighths of an inch in width, is fully one-sixth of an inch high in the middle, and is marked in the center by a broadly triangular, covered deltidium, having a distinct round perforation or foramen at the apex of the valve; area striated longitudinally, and the cardinal borders sloping to the extremities of the hinge line. Dorsal valve very convex, often quite gibbous in the middle; hinge line straight, and the area obsolete. Surface of the valves marked by fine, sharp, radiating striæ, which are crossed by numerous strongly marked varices of growth, giving a roughened character to the shell. The radiating striæ are also crossed by very fine, closely arranged, concentric rugæ; presenting, when seen under a glass, a sharp, file-like surface.

The species is somewhat of the type of *S.* (*Leptæna*) *plano-convexa* Hall, of the Cincinnati beds of Ohio, but differs in the greater rotundity of the dorsal valve and the largely developed cardinal area of the ventral valve.

Formation and locality. In the soft shales of the Hudson River group, at Delafield, Wisconsin.

STROPHOMENA WISCONSINENSIS; n. sp.

Shell of the type of, and much resembling, *S. planumbona* Hall (Pal. N. Y., p. 112, Pl. XXXI B, fig. 4), being half as wide again along the hinge, as the length from the hinge to the front of the

shell; hinge-line straight with submucronate extremities. Dorsal valve highly arcuate and gibbous in the middle, with an impressed umbonal region, and becoming strongly recurved at the hinge extremities. Ventral valve rather deeply concave, with a slightly rounded umbo and minute beak; cardinal extremities of the valve deflected. Area of the ventral valve moderately high in the center, gradually declining toward the extremities, and divided in the middle by a covered triangular deltidium; area of the dorsal valve linear. Surface of the shell marked by fine radiating striæ, and by a few strong concentric lines of growth.

The shell was at first considered as identical with *S. planumbona* Hall, but on critical examination, differs so extremely in the strongly gibbous character of the valves, and the much greater height of the ventral area, as well as in the more transverse outline, that it seems to be doing violence to strict classification to place it under the same name. I have therefore thought best to consider it as a distinct species.

Formation and locality. In the shales of the Hudson river group, at Delafield, Wisconsin.

RHYNCHONELLA NEENAH; n. sp.

Shell small, not exceeding five-eighths of an inch in its greatest diameter, and seldom more than half an inch; form varying from subtriangular to subquadrangular in a top view, subtriangular in profile and more or less irregularly quadrangular in a front view. Sides of the valves compressed and nearly vertical, and the depth of the shell, from the dorsal to the ventral surface, usually equaling or exceeding the length or width. Apex of the ventral valve small, narrowed or cuneate, projecting beyond that of the dorsal, and slightly curved upward, perforated at the extremity, and the fissures covered by deltidial plates of proportionally large size. Dorsal valve very deep, rapidly rising from the beak to near the front margin along the middle of the valve, where the height is generally double that of the ventral valve; sides of the valve much less elevated and almost regularly arc-

uate from beak to base. Ventral valve straight along the base, with a deeply sunken triangular mesial depression and rapidly sloping sides; the front of the valve strongly and abruptly elevated, corresponding to the notch of the dorsal fold.

Surface of the shell marked by about ten angular plications on each valve in the larger individuals, two of which are abruptly elevated to form the mesial fold, and two depressed in the sinus. On some of the specimens there is an incipient plication on each side of the fold in the upper half of the shell, which becomes obsolete before reaching the front margin. The plications are marked by strongly lamellose concentric lines, which arch backward in crossing them.

The species resembles *R. Anticostensis* and *R. Janea* Billings, but differs in the great lateral compression, and in having only two plications forming the mesial fold. It also resembles the form generally known as *R. dentata* Hall, as it occurs abundantly at Frankfort, Kentucky, and elsewhere in the west, but differs very materially from the New York specimens of that species. From the Frankfort, Kentucky, specimens it differs in the laterally compact and compressed form, nearly vertical sides, narrower and more angular plications, narrower and stronger fold and sinus, and stronger lamellose markings, as well as in the deeper and more unequal valves, and more projecting beak.

Formation and locality. It occurs in the Trenton at Neenah, Menasha, Center, Ripon, Waterloo, Janesville and Beloit, and in the altered Galena beds near Oshkosh, Neenah, Menasha and Flintville, and in the shales of the Hudson river formation, at Delafield and Iron Ridge, Wisconsin.

GENUS CYSTOSTYLUS; n. g.

Corallum compound, composed of parallel, cylindrical tubes or corallites, either wholly or in part in contact, and united to each other by transverse filaments. Increase by bifurcation. Internal structure composed of small cystose chambers or cavities, formed by more or less imperfect transverse plates, arranged in circular

funnel-formed order as in cystiphyllum. Radiating septa and transverse plates, obsolete.

The corals for which the above genus is proposed are in all respects compound *Cystiphyllia*, having all the internal features of specimens strictly referred to that genus. They differ, however, in being compound bodies, composed of a large number of corallites united by transverse branches, as in *Syringopora*, *Eridophyllum*, and others of that character, and are increased by a form of budding resulting in a bifurcation of a corallite. The cystose plates are arranged exactly as in *Cystiphyllum*, and form by their union, a deeply funnel formed cup at the upper end of the stem. The species at present known are both from the Niagara group, and are very distinct in their specific features, and characterize two different portions of the group. In the second species referred to this genus, it resembles *Syringopora* Goldf. to some extent, but differs in that the plates or tabulæ do not extend entirely across the tube, but are only partial, in some cases requiring three or four of the partial plates to complete the diameter of the tube.

CYSTOSTYLUS TYPICUS; n. sp.

Corallum growing in large compound masses, composed of numerous subparallel or slightly diverging tubes or corallites, which vary from one-fourth to one-half of an inch in diameter; attain a length of several inches, and are placed at distances from each other equal to from one-fourth to more than one-half their diameter. Connecting filaments distant. Interior composed of small cysts, or blister-like chambers, arranged in from three to six indistinct circles, as shown in a tranverse section of the tubes.

The specimens of the species vary greatly in the size, and in the distance between the corallites. Those examined consist mostly of fragments of larger masses, and are themselves several inches in diameter. They are preserved in limestone, which fills the spaces between the corallites, and on the fractured surfaces they reveal the cystose character of the tubes very beautifully, although the plates themselves are usually coated with minute crystals. Some

of the specimens preserve only the perforations in the rock where the corallites have been removed by solution, in which case they show only the size and form of the exterior surface of the corallite without retaining any of the internal features of the coral. In this case it is quite difficult to distinguish them from species of *Eridophyllum* or *Diphiphyllum.*

Formation and locality. In the Lower coral beds of the Niagara, at Cato, Manitowoc county, and in the Upper coral beds, at Sturgeon Bay, Wisconsin.

ZAPHRENTIS RACINENSIS; n. sp.

Corallum forming a short, rapidly-expanding, cup-shaped or turbinate body, nearly as wide as high, and strongly curved; calyx occupying nearly the entire depth of the body; the floor, in a specimen measuring one and one-quarter inches in diameter, not exceeding three-eighths of an inch in width; longitudinal or vertical lamellæ moderately well developed, but very thin and distinctly alternating in size, increasing in number only along the primaries dividing the dorsal and lateral sections; those of the two sections on the inner side of the curvature are more numerous than the others, counting ten in each division, while those of the outer divisions are only eight on each side, making, to the entire cup, thirty-six primary lamellæ on the specimen figured; fosset deep, situated on the outer side of the curvature, very narrow, and having only one primary lamella depressed within the cavity.

The examples of the species observed are all internal casts of the cup, but are well marked and quite numerous. They present evidence of the outer surface having been transversely wrinkled, which, owing to the thinness of the substance, have shown in the cup, and been preserved on the cast of the interior. The substance of the coral itself having been entirely removed from the rock by solution, it is impossible to ascertain the characters below the cup, but as the species is common, and seems to characterize the Racine beds, it has been thought best that it should be noticed.

Paleozoic Formations of Wisconsin.

Formation and locality. In the Racine beds of the Niagara group, at Racine, and at Schoonmaker's quarry, near Wauwatosa, Wisconsin.

ORTHOCERAS WAUWATOSENSE; n. sp.

Shell cylindrical, very gradually enlarging from the apex; the increase in diameter being only one-fourth of an inch in a length of three and a half inches. Section circular, and the shell quite thick. Septa very deeply concave, in fact but little less than hemispherical. Siphuncle apparently central. Surface of the shell marked by strong, elevated, flattened, encircling lines, which will average about six in the space of one fourth of an inch; but which are not quite regular, sometimes interrupted, and have from one to three finer striæ in the spaces between. On one side of the shell the lines make a broad, sweeping curve upward. There are also fine longitudinal lines at irregular distances and of irregular strength, on some parts being obsolete.

The shell has been a very elegant one when perfect, and in its peculiar encircling striæ differs from any species known. The specimen, unfortunately, consists of the outer chamber and a single septum only, so that the relative distance of the septa cannot be determined. The striæ under a magnifier show considerable variation of form; in some parts being flattened on the surface, in others slightly rounded, and again grooved by deep lines, while the interspaces undergo similar changes; but these variations are too obscure to be apparent to the unaided eye.

Formation and locality. In the Niagara group (Racine limestone), at Schoonmaker's quarry, near Wauwatosa, Wisconsin.

CYRTOCERAS INFUNDIBULUM; n. sp.

Shell small, very slightly curving, and very rapidly expanding from the apex to the aperture; the increase in diameter being half an inch in a length of one and one-eighth inches. Transverse section very slightly transversely oval, the two diameters at the upper end being as eight to nine, and the inner side of the shell a little more flattened than the outer curve. The longitudi-

nal curvature not perceptible on the inner face, but on the outer side it is quite apparent, although the swell of the arc is not more than one-twentieth of an inch in a length of one inch. Septa not positively determined, but so far as can be seen have been nearly flat, and comparatively distant. Siphuncle not seen. Surface of the shell marked by elevated, rounded, encircling bands or ridges, which are distant about one-twelfth of an inch on the lower end of the fragment figured, but increase in distance from below upward. The spaces between the bands are flattened, and have a faint line midway between the stronger bands, barely perceptible to the naked eye.

The species is peculiar for its rapidly expanding form, slight curvature and banded surface. It is most nearly allied to *Cyrtoceras brevicorne*, Hall (20th Rept. State Cab., p. 356, Pl. XVII, figs. 8 and 9), but differs in being less arcuate; more rapidly expanding, and in being widest from right to left instead of in a dorso-ventral direction. The surface characters also differ; although in the description of that one these are not stated, the impression left in the rock to which the individual is attached shows no surface markings, which would have been the case had such lines as exist on this one ever occupied the surface of that shell.

Formation and locality. In the Niagara group at Racine, Wisconsin.

LITUITES MULTICOSTATUS; n. sp.

Shell rather below a medium size, consisting of three and a half or four volutions, the outer of which slightly embrace the dorsal edge of the inner, are very gradually increasing in size throughout, and probably circular in a transverse section when not compressed, but in the specimen used and figured are of very much greater diameter in a dorso-ventral direction than laterally, giving a rather acute dorsal keel; most likely due to compression, the specimen being imbedded in the rock parallel to the stratification. Surface of the volutions marked by numerous, closely arranged and very regular, transverse costa, which are separated by con-

DESCRIPTIONS OF NEW SPECIES OF FUNGI.

By W. F. BUNDY.

PANUS TOMENTOSUS; sp. nov.

Pileus rather fleshy, becoming tough, depressed, nearly plane in some specimens, subinfundibuliform, dull yellowish, merging into purple, tomentous, outer zone densely covered with tawny hairs; margins incurved; gills narrow, decurrent, white, at first tinged with purplish; stipe excentric, short, thicker below, densely covered with tawny hairs.

From 1 to 1½ inch in height; pileus about as wide.

On oak logs. Ironton. July.

BOLETUS RADICOSUS; sp. nov.

Pileus thin, wide, recurved, yellow tinged with brown; cuticle easily removed; flesh pale yellowish, tinged with pink, not changing color when bruised; tubes decurrent, large, uneven-mouthed, compound, angular, tinged with brown; stipe flexuous, yellow above, whitish below, rough with dark appressed scales, fibrous rooted.

Height 3′ to 4′. Width of pileus 4′. Stipe 5″. Baraboo Bluffs. July.

BOLETUS LATERALIS; sp. nov.

Pileus moderately thin, umber, lighter toward margin, viscid, lateral margins incurved; tubes wide, shallow, angular, bounded by prominent, vein-like, lamellæ, connected by less prominent anastomosing dissepiments, yellow; stipe lateral, short, reticulated by decurrent anastomosing lamellæ, brown or olive brown, sometimes tinged with red.

Pileus 2′ wide. Stipe 5″ to 8″ long.

About old basswood stumps in swamps. Sauk City. August.